HARDWARE BUYER'S GUIDE

The Home User's Guide to Commodore Computing

U.S.A. $2.95
CANADA $3.95

RUN

November 1985 A CWC/I Publication

COMMODORE TO THE RESCUE!

ON THE TRAIL OF MISSING PERSONS

DISCOVER THE WORLD OF CP/M ON THE C-128

COMMODORE TAKES A QUANTUM LEAP

Program of the Month—PRINT SCREEN PLUS

SPRITE CONTROL ON THE C-128

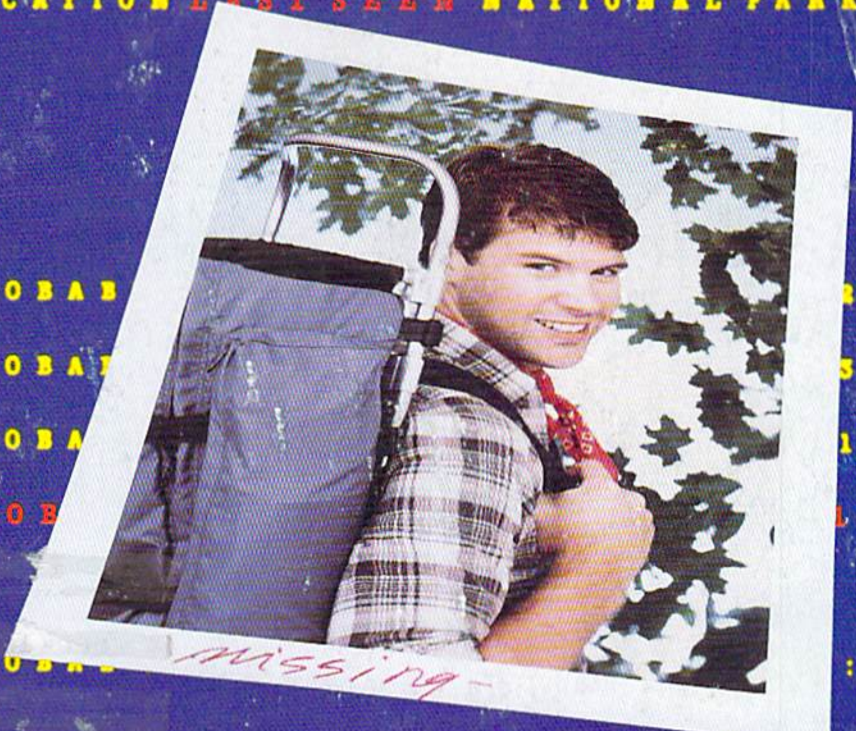
C-64 SOFTWARE FOR MODEM USERS

MISSING: JOHN CARR

AGE: 23 HEIGHT: 5'9" HAIR: BROWN

DATE LAST SEEN: 3 SEPT 1985

LOCATION LAST SEEN NATIONAL PARK



PROBAB 0%

PROBAB 55%

PROBA 15%

PROB 15%

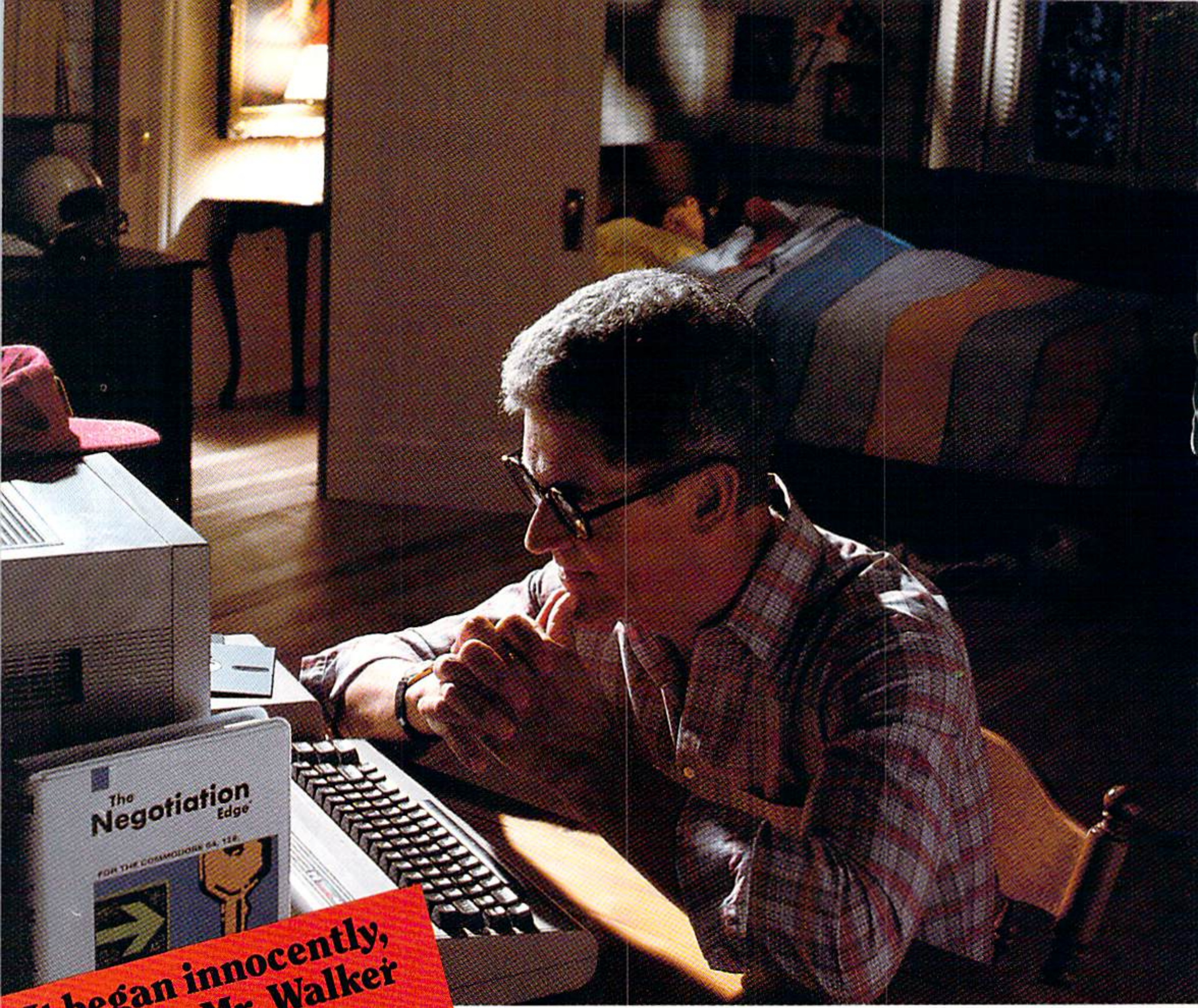
PROBAB :5%

WHICH AREA HAVE YOU SEARCHED?

POD FOR TEAM SEARCHING AREA 1?

11

0 74470 12069


The Negotiation Edge
FOR THE COMMODORE 64, 128

It began innocently, but soon Mr. Walker was running his entire career on little Bobby's Commodore.

Mr. Walker had never used a computer when he read about Info Designs' Negotiation Edge.™ He'd been meaning to ask for a raise and was looking for an "Edge."

That night, as Bobby slept, Mr. Walker's career turned. "Hey, Info Designs software makes Commodore® a terrific business computer."

The Edge line is people-insight software that's easy-to-use and only costs $79.95.*

He got the raise and bought the rest of the Edge line: The Sales Edge,™ Management Edge,™ and Communication Edge.™ His new love affair with Info Designs software was paying off.

Bobby's room became Mr. Walker's office away from the office. He bought Info Designs' WordPro III Plus™ package for $49.95 when he began issuing memos. And the complete Integrated Software Series for accounting: General Ledger, Payables, Receivables, Inventory, and Payroll for $49.95* each when he became a partner.

The ISS accounting modules are powerful, easy-to-use, and easy-to-learn. They include every business feature.

Mr. Walker was ecstatic with his new computerized business. And Bobby was happy because the monsters stayed in the closet while dad was in the room.

Don't let your Commodore and career sit on the shelf, Info Designs business software can help you get ahead. Buy it at your local software retailer. It makes good business sense.

*U.S. Currency. Accounting series marketed in different packaging for Canada.

PAYABLES
INVENTORY
PAYROLL
GENERAL LEDGER
RECEIVABLES
WordPro 3 Plus/64
64
The Negotiation Edge
The Management Edge
The Sales Edge
The Communication Edge

InfoDesigns®

Find the entire line of Info Designs business software at a dealer near you.

The 10 power-packed products of Info Designs business software line:

The Sales Edge™

Provides individually tailored strategy reports to improve customer relationships.

After the sales executive has completed the self-assessment and the customer-assessment, a sales strategy report is generated instructing the salesman in aspects of business style and personality most likely to strike responsive chords with the style of a given client.

The Negotiation Edge™

Designed to help the user prepare, develop, and successfully complete any negotiation or bargain.

On the basis of information provided by the user about himself and a specific counterpart, the program produces a detailed negotiation plan. The plan includes a step-by-step blueprint for winning negotiations in a variety of personal and business situations.

The Management Edge™

Advises the manager how to get results by increasing productivity, successfully motivating subordinates, and resolving on-the-job-conflicts.

After the manager agrees or disagrees with a series of statements, the machine assimilates information from a bank of proven management tactics and selects those most appropriate to the specified subordinate. Suggestions are printed in a detailed management strategy report on how to work with the individual and get the desired results.

The Communication Edge™

Prepares you to work more effectively in meetings and conversations. It enables you to emphasize your communication strengths and avoid the potential pitfalls built into any conversation.

The program presents a series of simple questions to assess your communication style and the styles of counterparts. A strategy report is generated detailing ideas for a better relationship and ways to communicate more effectively.

General Ledger

Get a customized chart of accounts and comprehensive management report, including financial statements and trial balances. This integrated program maintains present months, quarter- and year-to-date, plus previous quarter and year balances. (Interfaces with Receivables, Payables, and Payroll.)

Receivables

Makes it simple to maintain complete customer master files, including year-to-date activity, credit limit, authorization, and current balance. Provides reports on aged open receivables, invoices, statements, and customer activity lists. (Interfaces with General Ledger for automated posting.)

Payables

Build a master vendor file, including year-to-date purchases, current balance, and recurring vendor invoice information. Provides automatic aging of open items, check with full remittance information and check register. (Interfaces with General Ledger for automated posting.)

Inventory

Perpetual inventory records for all items include stock numbers, average cost, three retail prices, reservations, economic order quantity and re-order levels. Processes stock receipts, issues, orders and adjustments with full audit trails. Provides key management reports, including stock status, shortage and recommended re-order reports.

Payroll

A master record for each employee includes current period, quarter- and year-to-date pay activity. Automatically calculates period pay amounts, including miscellaneous pay and deductions, federal, state, and local taxes and FICA. Provides comprehensive reports, including W2s, 941s, payroll checks with full pay/deductions detail and payroll journals. (Interfaces with General Ledger for automated postings.)

WordPro III Plus™

An easy-to-use, full-functioned word processor with an installed base of 50,000 units. It includes built-in mail merging for form letters and global search & replace. It provides automatic page numbering, headers, footers, and automatically totals columns.

Buy the Info Designs line at one of these dealers:

UNITED STATES
Software City, all locations

Arizona
Austin Telephone & Computers, Phoenix

California
Computer 64 Store, Bell Flower
Computer Outlet, San Diego
HT Electronics, Sunnyvale

Connecticut
SoftTown, Danbury
20th Century Television, Hartford

Delaware
Software Kingdom, Dover

Florida
AA Computers, Jacksonville

Illinois
A Software Store, Oaklawn

New Hampshire
Micon Computer, Londonderry
SoftSpot, Manchester

New Jersey
Software City, Cherry Hill

New York
Boscov's Dept. Stores, all stores
CIA Software, Bayside
Computer Plus, Deer Park
Computer Plus, Hewlett
Computer Plus, Lake Grove
Computer Plus, Patchoque
Computerware, East Meadow
Micro Hutt, Bayshore
Micro Electronics, Valley Stream

Pennsylvania
Boscov's Dept. Stores, all stores
Whitehouse Computers, Williamsport
Some Hole In The Wall, Philadelphia

Texas
Babbages, Houston
Babbages, Dallas/Fort Worth
Federated/Videoland, all stores
The Computer Experience, San Antonio

Virginia
Virginia Micro Systems, Woodbridge

CANADA

Alberta
Compute or Play, Edmonton
Computerworks, Edmonton
Red Deer Microsystems, Red Deer
Selectdisk, Edmonton
Soft Options, Calgary
Wise Software Solutions, Calgary
Hindson Computing, Calgary
Hindson Computing, Lethbridge

British Columbia
Admiral Electronics, Surrey
Computer King, Prince George
Conti Computer System, Vancouver
Let's Compute Services, Kelowna
Nu-Tec Computers & Electronics,
Vancouver
Owen & Sons, Victoria
Softstuff, Burnaby
Super Software Inc, Richmond
The Computer Shop, Williams Lake

Manitoba
Canadian Computer ERA, Brandon
Micromart Inc, Winnipeg

Newfoundland
J.W. Allan Ltd, St. John's

Nova Scotia
Kobetek Systems Ltd, New Minas

Ontario
Canadian Software Source, Toronto
Computer Country, Stratford
Comspec, Downsview
Con-pute, Oshawa
G. Plus, Ottawa
Games Plus, Midland
Mr. Diskette, Ottawa
Software Capitol, Ottawa

Quebec
Soft Wares Co., Montreal

Saskatchewan
Memory Lane Computers, Saskatoon
Software Supermarket, Regina
Zycon Computing Ltd, Regina

InfoDesigns®
445 Enterprise Court, Bloomfield Hills, MI 48013
(800) 445-INFO

Registered Trademark: Commodore–Commodore Electronics Limited. Trademarks: The Negotiation Edge, The Sales Edge, The Communication Edge, and the Management Edge products–Human Edge Software Corporation–developed exclusively for Info Designs on the Commodore 64/128; WordPro III Plus–Professional Software–licensed to Info Designs.

COMPUTER
Centers of America Mail Order Ltd.

Christmas Gift Giving at Distributor LOW, LOW PRICES!

Computers • Printers • Monitors • Compact Discs • Robots • Modems

Computer Centers of America has it all...and much, much more at distributor's low, low discount prices! Why pay more when you can buy & save! Check out these prices!

WE'RE PROUD OF OUR PRICES - SATISFACTION GUARANTEED

Check, Money Order, MC or Visa accepted / No additional charge for MasterCard and Visa / Call for shipping and handling information / NYS residents add applicable sales tax / Prices and availability are subject to change without notice / All factory fresh merchandise with manufacturer's warranty. Dealers Welcome. Call for recent price reductions and new rebate information. Plus shipping and handling. No returns without return authorization number.

1-800-631-1003

IN NEW YORK STATE CALL TOLL FREE
1-800-221-2760
OR 516-349-1020

1-800-548-0009

Or Write: Computer Centers of America, 81 Terminal Drive, Plainview, NY 11803 commodore

PERSONAL COMPUTERS

NEW! **Commodore 128 Personal Computer**	**Call For Price**
1571 Disc Drive	**Call For Price**
1901 RGB Monitor	**Call For Price**
NEW! 141M Monitor	**Call For Price**
1702 Monitor	174.95
Commodore 64 Computer	144.95
1541 Disc Drive	169.95

PRINTERS

Same As Silver Reed 400

Cardco LQ/3 Daisy Wheel Printer Letter Quality Printer with Built-in Interface. Free Cardco Mail Now, Spell Now, Write Now Included	199.95
Gemini SG 10	209.95
Gemini SG 15	359.95
Gemini SG 10C with Built-in Commodore Interface	Call
New! Gemini SR 10115	Call
New! Gemini SB 10	Call
Silver Reed 400	249.95
Panasonic 1091	Call

MONITORS

Sharp 13" Color Composite Monitor 13M31U	144.95
BMC Color	149.95
Pan 1300 RGB & Comp.	289.95
Sharp Green	64.95
Sharp Amber	69.95

DISC DRIVES

CCA Exclusive - New for Commodore!

Enhancer 2000 Disc Drive Faster than Commodore 1541, Commodore Compatible, 2 Yr. Extended Warranty	164.95
Single Drive	179.95
Indus GT Disc Drive	249.95

TOMY ROBOTS

Unleash the Power of Your Computer Directly Into the Tomy Robots

Includes: •Computer, Interface, and Disk •Create, Edit, Save, Retrieve and Mix Your Programs •For Tomy Omnibot, Omnibot 2000 and Verbot All on the Same Disk ..... Call for Price

Interfaces

Telesys Turboprint GT Prints Enhanced Graphics	59.95
Cardco G+	Call
Microworld	Call
PPI	44.95

Discs

20 Memorex SS/DD w/Storage Case	24.95*

*After Rebate

Diskettes

Nashua	8.95
Scotch	11.95
Maxell	11.95
Memorex	8.95*
BASF	8.95

*After $3 Rebate

Modems

Mighty Mo	64.95
Commodore 1660	79.95
Total Telecommunications	Call

Wico Joysticks

The Boss	12.88
The Bat	14.88
3-Way	19.88

CCA GOES VIDEO TAPE CRAZY FOR CHRISTMAS

T-120's - TDK, maxell, SONY **$4.99** EA. Minimum 6

HOLIDAY SOFTWARE SPECIALS AT UNREAL PRICES

Software Special # 1

Datasoft

$5.99 EA. *LIMITED SUPPLY*

BRUCE LEE, DIG DUG, PAC MAN, POLE POSITION

Software Special # 2

ACTIVISION HOME COMPUTER SOFTWARE

$7.77 EA.

Decathlon
Pitfall I or II
Zone Ranger
Space Shuttle
Master of the Lamp
Star League Baseball
On Field Football
On Court Tennis
H.E.R.O.

Software Special # 3

ACTIVISION HOME COMPUTER SOFTWARE

$14.88 EA.

New! Fast Trax
New! Pet Person
New! Hacker
New! Hacker
New! Alcazar
New! Countdown to Shutdown

Software Special # 4

EPYX

$19.99 EA.

Fastload
Wintergames
Hot Wheels
Temple of Apshai Trilogy
Jet Combat Simulator
G.I. Joe
Summer Games I or II
Barbie
Hot Wheels
Baseball

Software Special # 5

ACTIVISION HOME COMPUTER SOFTWARE

GHOSTBUSTERS 8.88

Penguin Software

Quest	19.99
Transylvania	19.99
Sword of Kadash	19.99
Xyphus	19.99
Graphics Magician Picture Painter	21.99

Professional Software

Fleet System 2 - Word Processor with built-in 70,000 Word Spell Check	59.95

CBS Software

Dr. Seuss Fix up The Mix-up Puzzler	19.99
Sesame Street Letter-Go-Round	19.99
Big Bird's Fun House	19.99
The Sea Voyager	24.99
Weather Tamers	12.99
Movie Musical Madness	9.99
Success w/Decimals (Add/Subt) D-T	14.99
Success w/Decimals (Mult/Div) D-T	14.99
Success w/Fractions (Add/Subt) D-T	14.99
Success w/Fractions (Mult/Div) D-T	14.99
Ducks Ahoy	23.99
Ernie's Magic Shapes	23.99
Murder by the Dozen	23.99
Astro-Grover	24.99

Access Software

Neutral Zone D-T	20.95
Spritemaster D-T	20.95
Beachhead D-T	20.95
Master Composer-D	23.95

Commodore Software

Assembler D	27.95
Easy Finance I, II, III, IV-D	19.95
Easy Calc-D	64.95
Easy Script-D	39.95
Easy Spell-D	19.95
Logo-D	49.95
The Manager-D	37.95
General Ledger	37.95
Accts. Rec.-D	37.95
Accts. Pay.-D	37.95
Magic Desk-D	52.95
Silent Butler	24.95
Sky Travel	27.00

SPECIAL HOLIDAY HARDWARE PACKAGES FOR COMMODORE USERS

WOW

Commodore 64
Commodore 1541 Disc Drive
Commodore 803 Printer

399.95

TO SUBSTITUTE A COLOR MONITOR FOR THE 803 PRINTER PLEASE ADD **$40**

COMPACT DISCS

CCA Now Has An Exclusive Line of Compact Disc Players

ADC
Emerson
Sherwood
Magnavox
and Many More

Priced From **159.95**

COMPUTER Centers of America Mail Order Ltd.

Call Toll Free:

1-800-631-1003
1-800-221-2760 (in N.Y.S.)
1-800-548-0009

November 1985 RUN Vol. 2, No. 11

FEATURES

22 Commodore to the Rescue
This Commodore rescue program has even captured the interest of the U.S. Navy and Air Force.
By S.F. Tomajczyk

28 Communications Software: A Vital Link
Interested in telecommunications? Here's an overview of several popular terminal packages.
By Jim Grubbs

40 Print Screen Plus
Now, with only one program, you can easily print both low- and high-resolution screens.
By Robin Franzel

52 Sprite Control in C-128 Mode
A discussion of Basic 7.0's sprite commands and functions and a demonstration of their impressive capabilities.
By Louis R. Wallace and David P. Darus

62 Make a Little Music
With your C-64 and joystick, you can create short subroutines to adorn your programs with music.
By Arthur T. Chakalis

72 Bach to Basic
Basic techniques for creating harmonious chords.
By Larry Cotton

82 Datafile Restructure Utility
This addition to the Datafile series makes changes to your records easy.
By Mike Konshak

92 Brainstorming
This program helps you organize your thoughts so that making speeches and writing papers becomes easier.
By Mark Jordan

102 Hardware Buyer's Guide—1985
An overview of Commodore hardware that appeared in 1985.

110 Easy Assembly VI
This installment introduces you to the X and Y registers and tells you how to print the source code using your assembler.
By William Sanders

114 Telecommunications... On-Line with QuantumLink
Find out about Commodore's new information network...plus, an update on Delphi.
By Margaret Morabito

119 A Cure for the Data Statement Blues
Get to the real source of your Data statement errors, so you can quickly eliminate them.
By Donald H. Graham

120 CP/M and the C-128
Find out about CP/M and how the C-128 opens up a new world of software for Commodore users.
By Alex Lane

129 Instant Recall
Conserve memory with this quick and easy miniature information retriever.
By Rick Lockett

131 Wedgemaker
Create your own tailored wedge, to hold only those commands you use most.
By Alejandro A. Kapauan

136 Block Busters
Keep your eye on the ball. A one-player game requiring quick reflexes.
By Michael Longtin

Cover photography by Ed Judice

RUN (ISSN 0741-4285) is an independent journal not connected with Commodore Business Machines, Inc. *RUN* is published monthly by CW Communications/Peterborough, Inc., 80 Pine St., Peterborough, NH 03458. U.S. subscription rates $19.97, one year; $29.97, two years; $41.97, three years. Canada and Mexico $22.97, one year, U.S. funds drawn on U.S. bank. Foreign $39.97, one year, U.S. funds drawn on U.S. bank. Foreign air mail subscriptions—please inquire. Second class postage paid at Peterborough, NH, and at additional mailing offices. (Canadian second class mail registration number 9565.) Phone: 603-924-9471. Entire contents copyright 1985 by CW Communications/Peterborough, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. Postmaster: send address changes to *RUN*, Subscription Services, PO Box 954, Farmingdale, NY 11737. (Send Canadian changes of address to *RUN*, PO Box 1051, Fort Erie, Ontario, Canada L2A 5N8.) Nationally distributed by International Circulation Distributors. *RUN* makes every effort to assure the accuracy of articles, listings and circuits published in the magazine. *RUN* assumes no responsibility for damages due to errors or omissions.

DEPARTMENTS

6 RUNNING RUMINATIONS

8 MAGIC
Hints and tips that let you perform computing wizardry.

12 SOFTWARE GALLERY
- Telemessage
- Better Working Spreadsheet
- Eureka!
- Beach Head II
- PlayWriter/Adventures in Space
- Skyfox
- Paperback Writer 64

146 COMMODORE CLINIC
A questions-and-answers column to help your ailing computer.

154 BOOK GALLERY
- *Graphics for the Commodore 64 Computer*
- *1541 Single Drive Floppy Disk Maintenance Manual* and *1541 Maintenance Guide*

156 HARDWARE GALLERY
- Reset Master
- G-Wiz

160 COMMODORE SERVICE NETWORK UPDATES
Corrections and additions to our service network list.

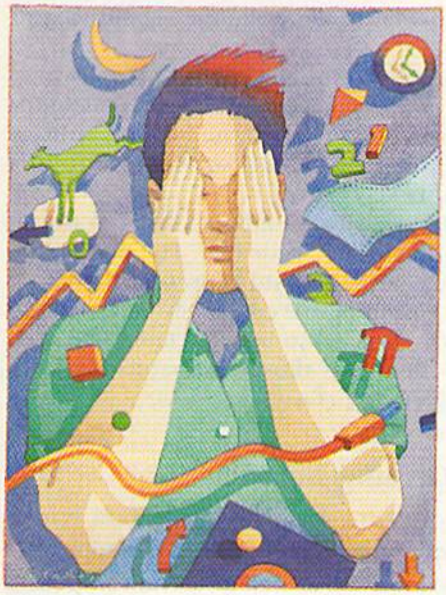
168 MAIL RUN

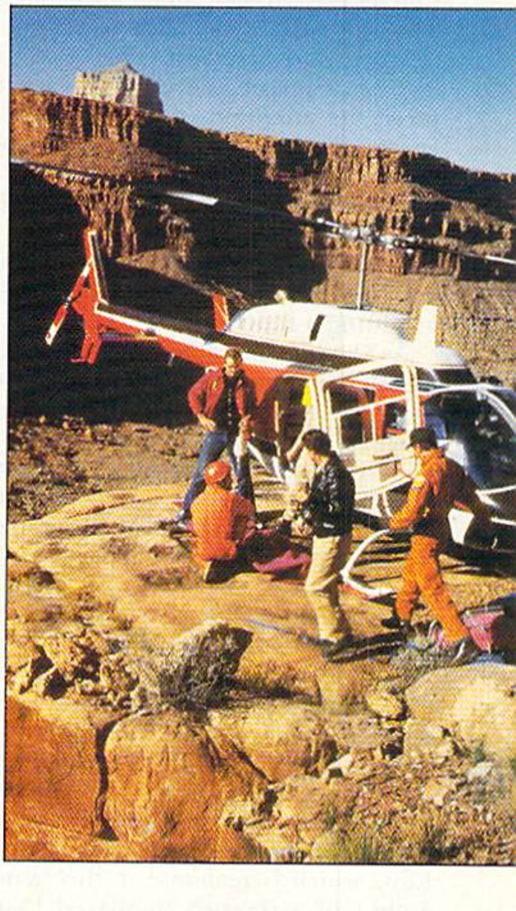
170 NEW PRODUCTS

175 HOW TO TYPE LISTINGS

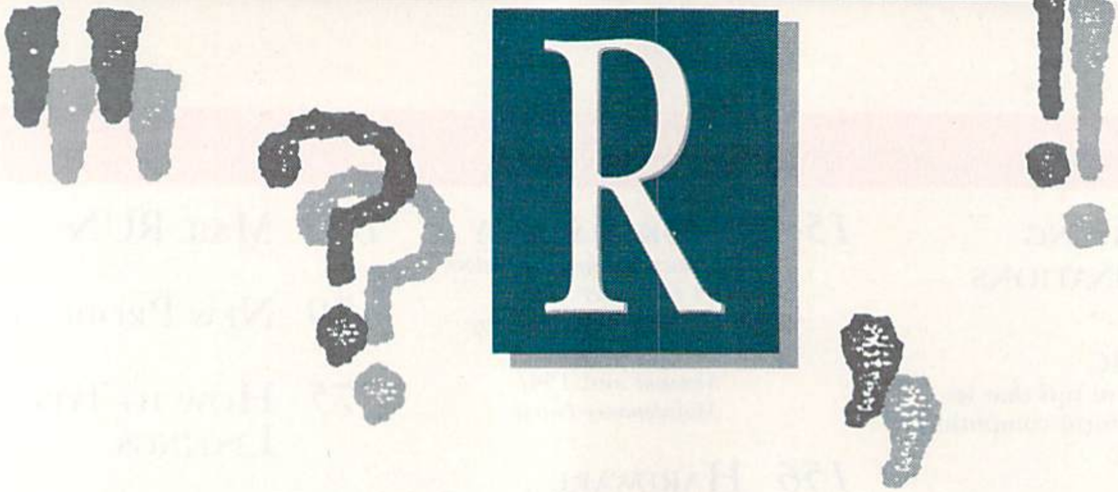
175 RUN AMOK

176 COMING ATTRACTIONS





RUNNING RUMINATIONS



November Highlights

In the lead article for this November issue, we feature a "life-or-death" application of the Commodore 64. Search-and-rescue experts in the rugged southwestern U.S. are relying on the 64 and a remarkable program called CASIE to help them locate lost or missing persons. The program's 90 percent success rate in finding stranded campers, lost hikers or other victims justifies its use in large-scale rescue missions. This application has also captured the attention of both the U.S. Navy and the Air Force, who are considering the system for their search missions.

The exciting world of the C-64 continues in this issue with a useful program called Print Screen Plus, which will print out your graphics screen displays—whether you're in low- or high-resolution mode. And it's as easy as hitting a function key.

As Commodore's new 128 computer is being released to retail outlets (disk drives and monitors are not far behind, Commodore tells us), *RUN* is beefing up its coverage of that system. In this issue, we'll explore the sprite graphics capability of the C-128, and readers will also find out what versions of CP/M will run on the C-128 and how to load and run CP/M programs.

This year has been a busy one for Commodore-related manufacturers. Over 125 new products for Commodore users have been released in 1985. November readers will be able to determine what new peripherals and accessories are available for the Commodore systems by turning to *RUN*'s second annual hardware buyer's guide (p. 102). Products for the C-64 and C-128 are listed and categorized, along with a brief description, the price and the name and address of the manufacturer.

Telecommunications enthusiasts will be anxious to read about Commodore's new electronic network, Quantum-Link, which is reviewed in this issue. Also, Jim Grubbs, author of a recently published book entitled *The Commodore Ham's Companion*, takes a hard look at some of the major commercially available communications software for modem users.

RUN continues its support of the popular Datafile database series with a useful companion utility program that's sure to please. The DFRestructure program lets you easily and "safely" change existing files created by Datafile and save the new file.

Micro-Novel Contest

RUN recently notified the five winners of its Great RUNaway contest, in which each winner received hardware and software totalling over $6000. Next month we will publish the names of the winners and share their reactions with you.

If you were unsuccessful in the Great RUNaway, here's another opportunity for you to be a winner.

Called the "Great American Writing Contest," this contest is actually open to school-age children, who will compete in various age levels to create the best "micro novel" using Woodbury Software's PlayWriter Series.

Through their participation in this contest, youngsters will not only develop skills in reading, writing and editing, but will also experience a great deal of satisfaction in producing their own books. Entries will be judged according to content, originality, grammar, spelling and overall effect.

Woodbury Software and Grolier Electronic Publishing, co-sponsors of this contest, have announced that entry blanks will be distributed through the schools and at selected retailers. An entry form is also available in this issue of *RUN* (see p. 165).

RUN is excited about its role—albeit a limited one—in promoting this educational endeavor. For many children and parents, this contest could represent their first introduction to the Commodore computer as a real educational tool. *RUN* is pleased to be associated with this enterprise, and we commend those companies that are also supporting this writing contest.

Good luck to all the entrants!

db

Jump on Our RUNning Board

RUN invites you to contact its bulletin board (RUNning Board), which provides up-to-date information about *RUN* and the Commodore industry, as well as useful computing hints and tips. You can get on-line any time, 24 hours a day, seven days a week, by dialing 603-924-7632. We use a standard protocol, 300 baud, one stop bit, no parity, full duplex and a word length of eight bits.

PUBLISHER
Stephen Twombly

EDITOR-IN-CHIEF
Dennis Brisson
MANAGING EDITOR/PRODUCTION
Swain Pratt
COPY EDITOR
Marilyn Annucci
REVIEW EDITOR
Susan Tanona
NEW PRODUCTS EDITOR
Harold Bjornsen

TECHNICAL MANAGER
Margaret Morabito
TECHNICAL EDITOR
Timothy Walsh
TECHNICAL ASSISTANT
Jim Witham

ASSOCIATE EDITORS
Christine Adamec, Robert Baker,
Louis F. Sander, Jim Strasma,
Guy Wright

ADVERTISING SALES MANAGER
Stephen Robbins
SALES REPRESENTATIVES
Ken Blakeman, Nancy Potter
AD COORDINATOR
Heather Paquette
1-800-441-4403
MARKETING COORDINATOR
Wendie Haines
WEST COAST SALES
Giorgio Saluti, manager
1-415-328-3470
1060 Marsh Road
Menlo Park, CA 94025

ART DIRECTOR
Glenn Suokko
PRODUCTION/ADVERTISING SUPERVISOR
Rosalyn Scribner
EDITORIAL DESIGN
Anne Dillon
Karla M. Whitney

GRAPHIC SERVICES MANAGER
Dennis Christensen
FILM PREPARATION SUPERVISOR
Robert M. Villeneuve
TYPESETTING SUPERVISOR
Linda P. Canale

MANUFACTURING MANAGER
Susan Gross

PRESIDENT/CEO
James S. Povec
VICE-PRESIDENT/FINANCE
Roger Murphy
VICE-PRESIDENT OF PLANNING AND CIRCULATION
William P. Howard
ASSISTANT GENERAL MANAGER
Matt Smith
ASSISTANT TO VP/FINANCE
Dominique Smith
EXECUTIVE CREATIVE DIRECTOR
Christine Destrempes
CIRCULATION MANAGER
Frank S. Smith
DIRECT & NEWSSTAND SALES MANAGER
Raino Wirein
800-343-0728
DIRECTOR OF CREDIT SALES & COLLECTIONS
William M. Boyer
FOUNDER
Wayne Green

Circle 137 on Reader Service card.

GUARANTEED SOFTWARE

NEW

NEW

VIZASTAR for the C128

Vizastar, the integrated spreadsheet, database and graphics program that has the Commodore 64 world raving, is now available for the C128. It boasts 80 columns, and has over 40K of free memory in the spreadsheet. Those who already own Vizastar 64 will be pleased to know that your existing files can be read by Vizastar 128. Also, you can upgrade to the 128 version. Call us for details and pricing.

"The only other comparable product would be Lotus 1-2-3 for the IBM PC; nothing in the C64 world comes even close to the features of Vizastar."
AHOY July 85

"I found Vizastar would do anything Lotus 1-2-3 could, and then some. It's my Commodore choice to become the standard against which the others will be judged."
INFO 64 Magazine, Issue #7

"Vizastar is an exceptional package that rivals the features of programs such as Lotus 1-2-3 and offers C64 owners the kind of integrated software previously only available for higher-priced systems."
RUN Magazine, June 1985

"I scrutinized, tested and experimented with Vizastar extensively, but could find no weaknesses whatsoever. It is the most comprehensive, most flexible, most powerful and easiest to use integrated software package I've worked with."
Commodore Microcomputer, Sept/Oct 1985

"I use an IBM PC at work with Lotus 123. I feel Vizastar is just as good and in someways better than 1-2-3."
Steven Roberson, NC, End User

"I have used Multiplan and Superbase; both are good pieces of software, but are inadequate when compared to Vizastar."
Jim Mathews, WA, End User

"So good, I bought a second C64 and Vizastar for my office. A wild bargain! You've saved me from having to buy IBM and Lotus."
Philip Ressler, MA, End User

VIZAWRITE CLASSIC for C128

This is the new word processor from Vizastar's author, Kevin Lacy and is the successor to Omniwriter, which he also wrote. All the features of Omniwriter are there, plus many significant enhancements, like auto pagination, on-line help, pull-down menus, full-function calculator and more. Up to 8 'newspaper-style' variable-width columns can help with newsletters.

Three different proportionally-spaced "near letter quality" fonts are also built-in for use with Commodore or Epson compatible printers. You can merge almost any other word processor file directly into Vizawrite, including Paper Clip and Omniwriter. Naturally, it is also compatible with Vizastar. At all times, what you see on the screen is exactly the way it will be printed out. Vizawrite can do mail-merges and has an integrated 30,000 word spelling checker that you can expand yourself.

PROGRAM SPECIFICATIONS

Both Vizawrite and Vizastar are written in 100% machine language and run in the 128's FAST mode, making it lightning fast. They require a C128 with 80 column color or monochrome monitor. Both come with a cartridge, a diskette, a backup, and a reference manual. Vizastar also includes a 50 page tutorial book. Both work with 1541 or 1571 disk drives.

RISK-FREE OFFER

Vizastar 128 is priced at $119.97. Vizawrite's price is $79.97, but as an introductory offer, it is now only $69.97. Vizastar 64 XL8 is now available for $119.97. We are so positive you will be satisfied with our programs that we offer a 15-day money-back guarantee. Try it Risk-Free. Call us today or send a check or money order. VISA/MC accepted.

Calif. residents add 6.5% Sales Tax.
Add P&H: UPS-$4; COD/Canada-$7.

SOLID STATE SOFTWARE

1125 E. Hillsdale Blvd., Suite 104
Foster City, CA 94404-1609
(415) 341-5606

• Dealer Inquiries Welcome •

Trademarks: Lotus 1-2-3/Lotus Development
Commodore 64/Commodore Electronics Ltd. Multiplan/Microsoft

MAGIC

Compiled by LOUIS F. SANDER

MAGIC is tricks, MAGIC is fun.
MAGIC is doing what cannot be done.

Every month, Magic brings you brief and useful computer tricks from around the world—tricks to make computing easier, more enjoyable or more exciting. We number our tricks in hex, the counting system of sorcerers and computerists.

Magic solicits your simple hardware ideas, short programs, useful programming techniques, little-known computer facts and similar items of interest. We look for new or recycled material that can be implemented with a minimum of time, effort or theoretical knowledge and that is of current value to Commodore computerists (Plus/4 and C-16 owners, too). RUN will pay up to $50 for each trick accepted. Send your tricks to:

MAGIC
c/o Louis F. Sander
PO Box 101011
Pittsburgh, PA 15237

If you enclose a self-addressed stamped envelope, we'll send you a Trick Writer's Guide. Readers outside the United States may omit the stamp.

In Magic's early days, we received and printed lots of one-liners—VIC and C-64 programs that could be written using a single line number. After a year or so, our readers exhausted the possibilities of the genre, and the flow of original ideas dried up. Well, a new day has dawned, and its name is Commodore 128! Not only are there new capabilities to show off in a one-liner, but also a single line number can be used on a 160-character line. So, once again, we're looking for one-line programs, and we expect to receive some great ones. The first of the new breed appears below.

$264 **Sprite shower**—This one-liner for the Commodore 128 gives a dazzling and animated depiction of sprites and how they move. Not only is it fun to watch, but it's also a useful tutorial on C-128 sprites and how they're controlled.

```
10 FOR J=3584 TO 4095 : POKE J,204 : NEXT : FOR K=1 TO 8 :
   SPRITE K,1,K : MOVSPR K,50*K#K : NEXT
```

Mary Lee McCafferty
Butler, PA

$265 **That which flies**—Since this issue of *RUN* actually arrives before November first, the accompanying program will provide some timely entertainment, as well as some insight into sprite handling on the C-64. The Data statements contain a sprite, which the rest of the program Pokes into memory and animates.

```
10 REM THAT WHICH FLIES - SAMUEL SEWALL
20 POKE53281,6:PRINT"{SHFT CLR}{COMD 7}{4 C
   RSR DNs}"
30 FORS=832TO894:READT:POKES,T:NEXT
40 V=53248:POKE2040,13:REM SPRITE AREA
50 POKEV+21,1:REM DISPLAY SPRITE
60 POKEV+39,1:REM COLOR IT WHITE
70 POKEV+1,60:REM Y POSITION
80 FORJ=1TO255:POKEV,J:NEXTJ:REM X POS
90 LIST
91 DATA 000,000,000,000,064,000,000,064
92 DATA 000,000,096,000,000,096,000,003
93 DATA 252,000,000,240,000,000,096,001
94 DATA 255,225,204,063,255,112,124,240
95 DATA 192,248,251,000,112,252,000,225
96 DATA 248,000,001,252,000,003,102,000
97 DATA 028,099,000,120,097,192,248,096
98 DATA 000,176,112,000,032,000,000,000
```

Samuel Sewall
Salem, MA

$266 **That which flies not**—When you tire of the preceding trick, just change sprites by adding the following lines to the program. They will replace some lines you previously typed, so you'll really have two programs, each with its own title and Data statements and each with identical lines 20–90. Give thanks for the typing we've saved you.

Try sending your own best sprite to Magic. Put it in our standard form: as Data statements numbered 91–98, with leading zeroes to make each entry three characters long. Include a description of your sprite, but don't include Poking or animation routines.

```
10 REM THAT WHICH FLIES NOT - L. SANDER
91 DATA 000,000,000,005,000,000,042,160
92 DATA 000,085,080,000,042,168,000,085
93 DATA 080,000,170,168,000,085,240,000
94 DATA 175,252,014,095,255,223,047,255
95 DATA 253,095,255,249,039,255,248,003
```

Resolved at Last!

The Greatest Super Bowl Team of All Time!

(NOW DUST OFF YOUR COMPUTER . . . AND FIND OUT!)

Find out for yourself which football team was the best ever. Find out who were the really best coaches . . . and who were the bums. Find out who were best under pressure. Was it the Colts' Johnny Unitas, Joe Thiesmann and the Redskins or the Jets' Joe Namath, or maybe it was Packer coach Vince Lombardi who made the difference after all? Super Bowl Sunday sets the stage for YOU to take control.

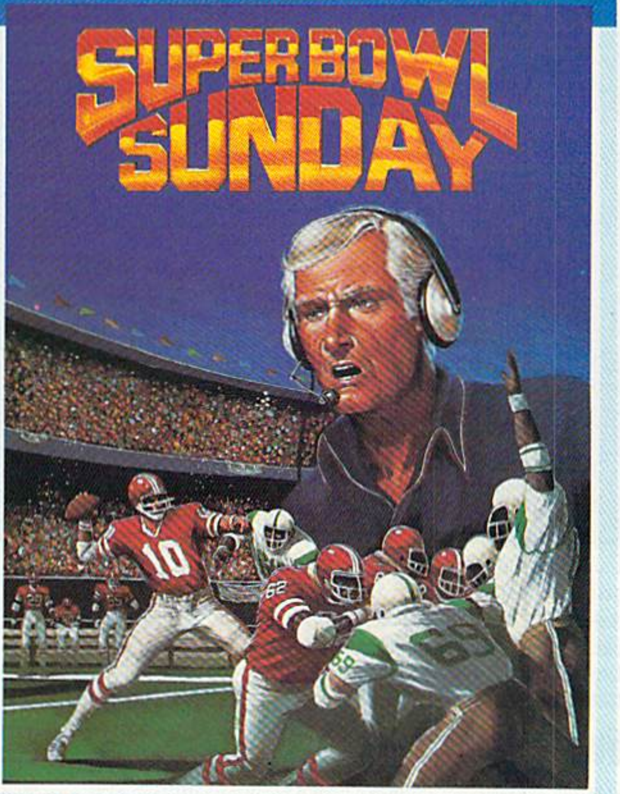
Now YOU Get that Chance!

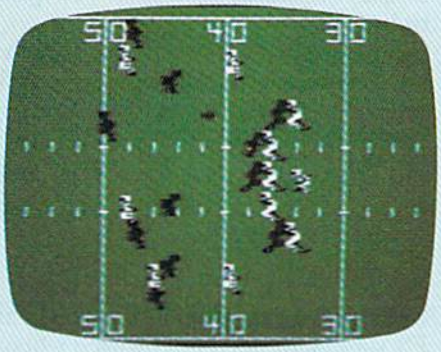
Super Bowl Sunday gives you the 20 greatest Super Bowl teams of all time, computer analyzed to perform with proper guidance, just as they did in real life. In Super Bowl Sunday you can match up any team against any other regardless of year . . . here's your chance to resolve once and for all who the best of the best really is.

Three Modes of Play!

Super Bowl Sunday is really 3 games in one; you can play head-to-head against another live opponent in the 2-player version . . . or play solitaire against the computer programmed to react to your strategy . . . or set the computer on autoplay and watch the computer play against itself.

Regardless of which version, you will be amazed at the graphics. This is the only statistically authentic game to give you all 22 players on the screen at once going through the actual play in animated action.





Full-screen re-enactment of all your plays!

The Greatest Super Bowl Team is . . .

We're not giving away any secrets—just set your game on autoplay and you might get the answer. But, if you think you're a coaching genius, by playing the other versions you might change history after all. Super Bowl Sunday challenges you to do just that! Super Bowl Sunday is ready to run on your:

Apple® II Family, Commodore® 64/128 and IBM® PC, PCjr. $35.00

Season disks (where you can re-create an entire season) also available separately.

® Trademark Apple Incorporated, Commodore Business Machines, and International Business Machines

microcomputer games DIVISION

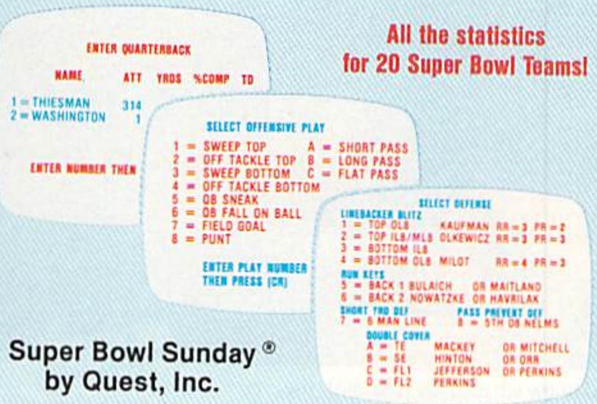
The Avalon Hill Game Company

4517 HARFORD ROAD, BALTIMORE, MD 21214 • 301 254-9200

Here's Everything You Get:

- ★ **20 Super Bowl Teams** including all the players' names and positions (press the "L" key and you see the strengths of each offensive vs defensive matchup based on seasonal performances).
- ★ More than a dozen **offensive and defensive plays** to choose, giving YOU control over which players do what.
- ★ Individual players' performances and statistics are updated throughout the game. You can view them during and after the game on your screen or keep permanent records using the printer option.
- ★ Your brilliant play re-enacted by **all 22 players** on the screen.
- ★ **Three modes of play:** head-to-head, solitaire and autoplay.

All the statistics for 20 Super Bowl Teams!



```
ENTER QUARTERBACK

NAME          ATT  YRDS  %COMP  TD

1 = THIESMAN   314
2 = WASHINGTON   1

ENTER NUMBER THEN
```

```
SELECT OFFENSIVE PLAY

1 = SWEEP TOP          A = SHORT PASS
2 = OFF TACKLE TOP     B = LONG PASS
3 = SWEEP BOTTOM       C = FLAT PASS
4 = OFF TACKLE BOTTOM
5 = QB SNEAK
6 = QB FALL ON BALL
7 = FIELD GOAL
8 = PUNT

ENTER PLAY NUMBER
THEN PRESS (CR)
```

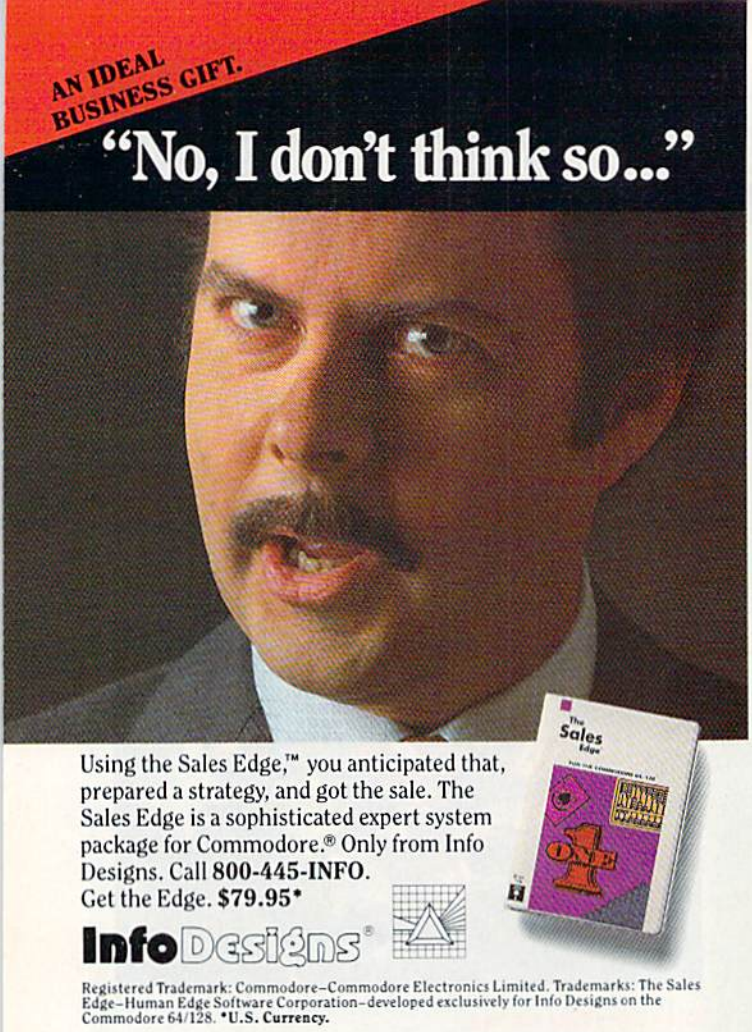
```
                SELECT DEFENSE
LINEBACKER BLITZ
1 = TOP OLB       KAUFMAN  RR = 3  PR = 2
2 = TOP ILB/MLB OLKEWICZ RR = 3  PR = 3
3 = BOTTOM ILB
4 = BOTTOM OLB  MILOT      RR = 4  PR = 3
RUN KEYS
5 = BACK 1 BULAICH    OR MAITLAND
6 = BACK 2 NOWATZKE  OR HAVRILAK
SHORT YRD DEF          PASS PREVENT DEF
7 = 6 MAN LINE         8 = 5TH DB NELMS
      DOUBLE COVER
      A = TE     MACKEY      OR MITCHELL
      B = SE     HINTON      OR ORR
      C = FL1    JEFFERSON   OR PERKINS
      D = FL2    PERKINS
```

Super Bowl Sunday®
by Quest, Inc.

Available at:
Toys "R" Us/Lionel Kiddie City/Games and Gadgets/Electronic Boutique/Select **Software City Stores**/Select **K-Mart Stores**/Select **Sears Stores**/Select **Montgomery Ward Stores**/Select **Warehouse One Stores**/Select **Target Stores** and **BETTER GAME/COMPUTER STORES EVERYWHERE.**

CALL TOLL FREE 1-800-638-9292
FOR ORDERING INFORMATION.
ASK FOR OPERATOR 1

©1985 • Baltimore, MD • Printed in USA • All Rights Reserved
• Computer and Audio Visual Display Copyrighted

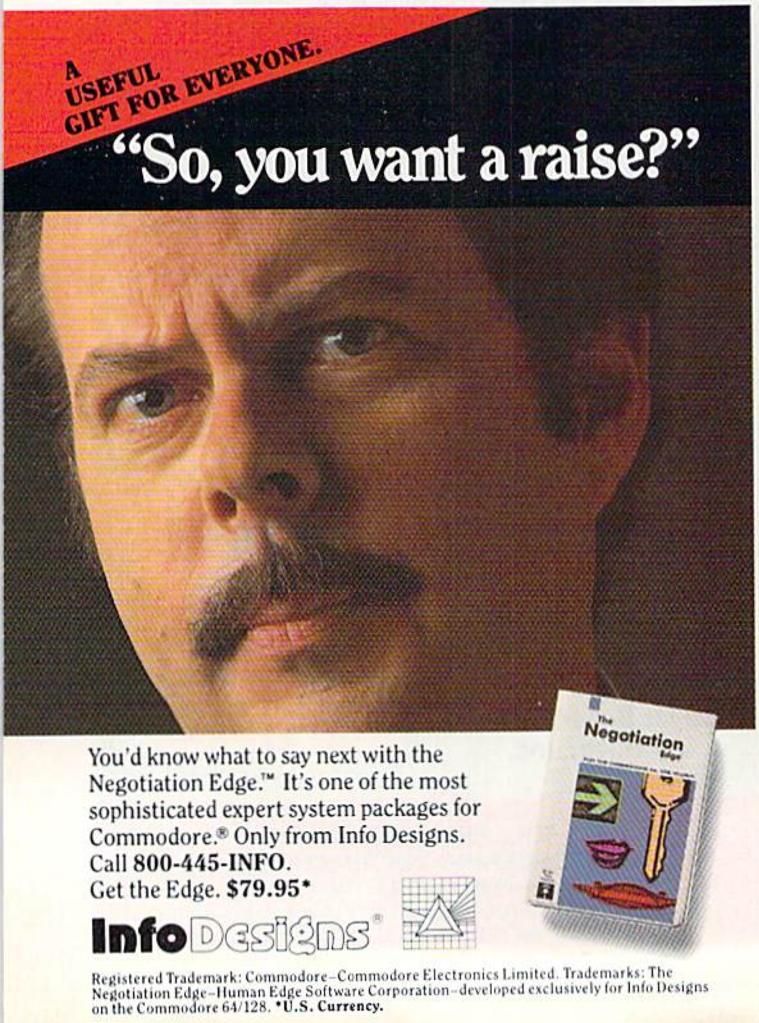


AN IDEAL BUSINESS GIFT.
"No, I don't think so..."
The Sales Edge

Using the Sales Edge,™ you anticipated that, prepared a strategy, and got the sale. The Sales Edge is a sophisticated expert system package for Commodore.® Only from Info Designs. Call **800-445-INFO**.
Get the Edge. **$79.95***

InfoDesigns®

Registered Trademark: Commodore–Commodore Electronics Limited. Trademarks: The Sales Edge–Human Edge Software Corporation–developed exclusively for Info Designs on the Commodore 64/128. ***U.S. Currency.**



A USEFUL GIFT FOR EVERYONE.
"So, you want a raise?"
The Negotiation Edge

You'd know what to say next with the Negotiation Edge.™ It's one of the most sophisticated expert system packages for Commodore.® Only from Info Designs. Call **800-445-INFO**.
Get the Edge. **$79.95***

InfoDesigns®

Registered Trademark: Commodore–Commodore Electronics Limited. Trademarks: The Negotiation Edge–Human Edge Software Corporation–developed exclusively for Info Designs on the Commodore 64/128. ***U.S. Currency.**

```
96 DATA 255,248,001,255,224,003,127,128
97 DATA 001,130,000,000,227,192,000,000
98 DATA 000,000,000,000,000,000,000,000
```

L.F.S.

$267 Typing Data statements—When typing a series of Data numbers, I place my fingers over the number keys, using them as the home row. Instead of inserting commas between the numbers, I use my thumb to enter spaces. Then, after entering the line, I go back to the beginning, this time proofreading my work and using the comma and cursor-right keys to put the commas where they belong.

I have found that I can enter data much faster this way, because of the modified touch system of typing and the accuracy that comes from the overall process.

K.W. McFall
Connersville, IN

$268 Deek—Commodore machines store addresses in a low-byte, high-byte format, which means that to convert the address to decimal form, you must enter a statement similar to

```
20 SV = PEEK(45) + 256 * PEEK(46)
```

to get the value of the low byte plus the high byte multiplied by 256.

If your program does many such conversions, it may be convenient to set up a user-defined function to do them. Often the function is named DEEK (a mnemonic for Double pEEK). Here it is:

```
10 DEF FN DEEK(A) = PEEK(A) + 256 * PEEK(A + 1)
```

When you want to find a two-byte address whose low byte is at NN, you enter

```
20 SV = FN DEEK (NN)
```

Notice that the dummy variable name used in the DEF FN statement need not be used when you call the function itself.

William Keith Prusaczyk
Athens, GA

$269 Improving on INT—The Basic function INT(X) is very useful, but sometimes you want the integer closest to X. (INT works by a kind of truncation, not by rounding off.) The simplest way to get the rounded value is by the formula INT(X + 0.5).

This works for both positive and negative numbers, but a problem still remains, since

INT(+ 3.5 + 0.5) = 4 and INT(− 3.5 + 0.5) = − 3

You can cure this by defining and using a function such as

```
DEF FNI(X) = SGN(X)*INT(SGN(X)*X + 0.5)
```

Jerry Bridgman
Madison, WI

$26A Quote mode tip—When a quotation mark is printed to the screen, the value of memory location 212 (C-64 and VIC) is changed from its normal 0, and the computer goes into Quote mode. In Quote mode, of course, cursor controls and other control characters print as reverse-field graphics symbols. If you print the quote mark from within a program, but want to avoid going into Quote mode, just enter POKE 212,0.

Joseph R. Charnetski
Dallas, PA

$26B **Memory Scope**—The accompanying program will display one page of memory at the top of your computer's screen. Unlike a machine language monitor, the Memory Scope display changes along with the contents of memory, letting you see what happens as keys are pressed or Basic statements are executed.

The main listing below is a Memory Scope for the C-64. The others are the changes that must be made to accommodate the indicated machines. If you use one of these machines, you should type in the C-64 version, then add the changed lines as shown.

A memory page is a 256-byte block of memory, and pages start at integral multiples of 256. The pages with low numbers and those with high numbers are the most interesting to explore; there are no pages numbered greater than 255. To find the page number of any address, divide it by 256 and drop everything after the decimal point.

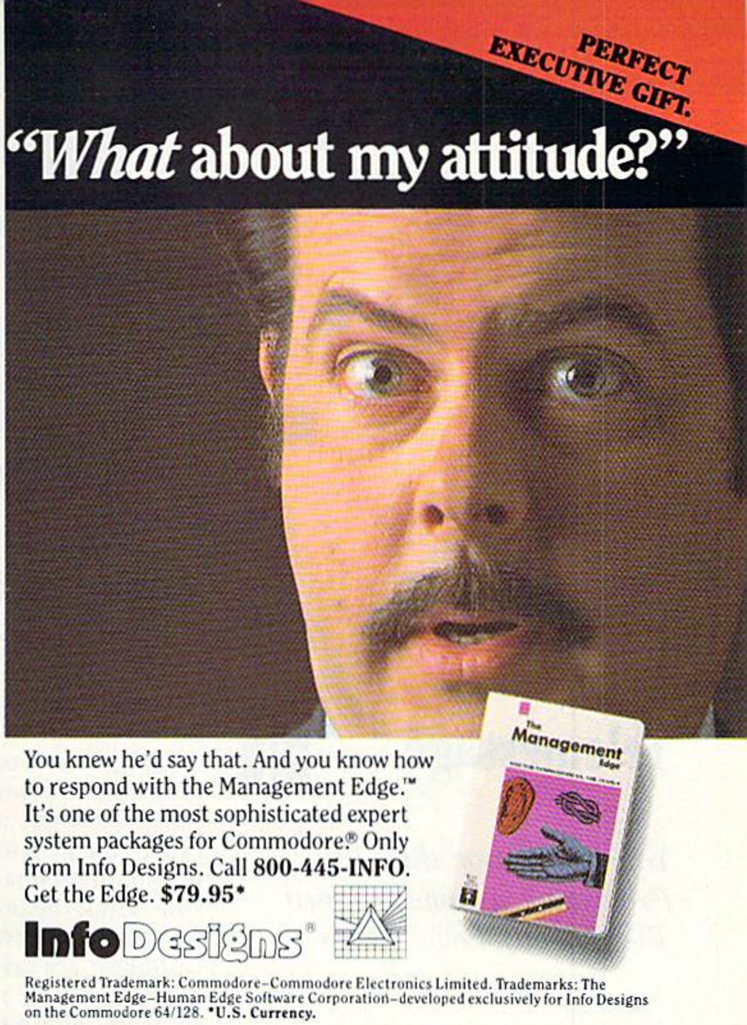
In the display, the characters have their screen Poke values: @ = 0, A = 1, B = 2 and so on. A complete listing appears under Screen Display Codes in the back of your user's manual. If your cursor disappears while using Memory Scope, it's probably hiding behind the display. Cursoring down will bring it back into view.

Memory Scope is a simple but powerful tool for understanding your computer's operation.

```
1 REM MEMORY SCOPE - LOUIS F. SANDER
2 REM C-64 VERSION
3 DATA 120,169,145,141,020,003,169,003
4 DATA 141,021,003,088,096,173,136,002
5 DATA 141,158,003,162,000,189,000,000
6 DATA 157,000,004,202,208,247,162,000
7 DATA 173,134,002,157,000,216,202,208
8 DATA 250,076,049,234,4764
10 FORJ=1TO44:READK:CS=CS+K:NEXT:READCK
20 RESTORE:IFCS<>CKTHENPRINT"BAD!":STOP
30 FORJ=900TO943:READK:POKEJ,K:NEXT
40 V$="{SHFT CLR}{6 CRSR DNs}":W$="{CRSR DN
   }":X$="RESTORE"
50 PRINTV$TAB(18)"POKE923,N - SYS900"W$
60 PRINT"POKE923,N TO SEE MEMORY PAGE N
70 PRINT"{CRSR DN}TO KILL THE DISPLAY, PRES
   S
80 PRINTX$" WHILE PRESSING {CTRL 9}STOP{CTR
   L 0}
90 PRINT
100 PRINT"TO REACTIVATE, DO A SYS900
110 SYS900:PRINT:PRINT
```

```
2 REM PLUS/4 & C-16 CHANGES
4 DATA 141,021,003,088,096,173,062,005
7 DATA 173,059,005,157,000,008,202,208
8 DATA 250,076,014,206,4350
```

Continued on p. 140.

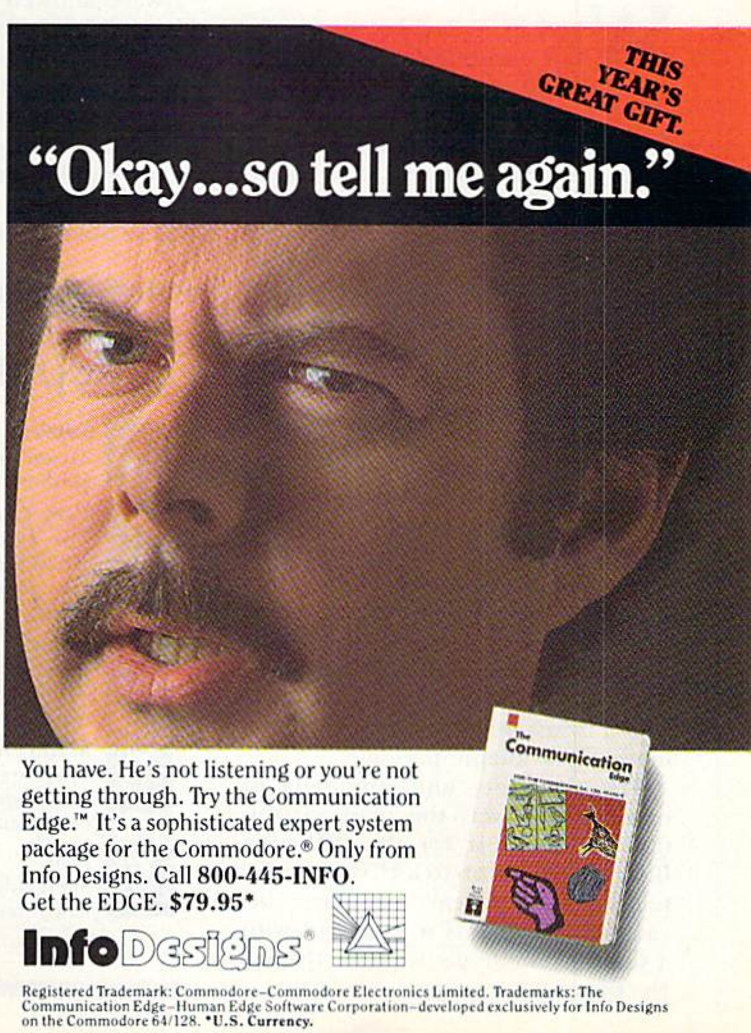


"*What* about my attitude?"

You knew he'd say that. And you know how to respond with the Management Edge.™ It's one of the most sophisticated expert system packages for Commodore.® Only from Info Designs. Call **800-445-INFO**. Get the Edge. **$79.95***

InfoDesigns®

Registered Trademark: Commodore–Commodore Electronics Limited. Trademarks: The Management Edge–Human Edge Software Corporation–developed exclusively for Info Designs on the Commodore 64/128. ***U.S. Currency.**

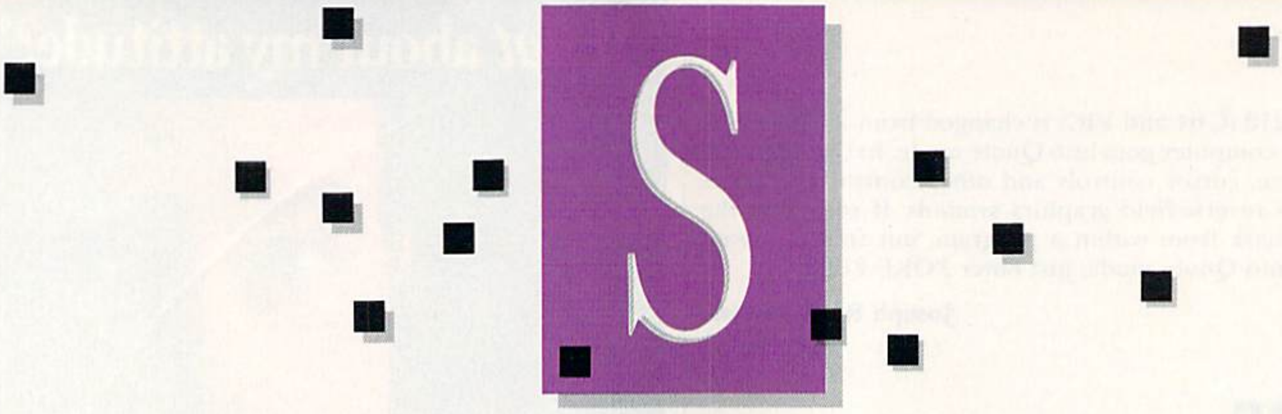


"Okay...so tell me again."

You have. He's not listening or you're not getting through. Try the Communication Edge.™ It's a sophisticated expert system package for the Commodore.® Only from Info Designs. Call **800-445-INFO**. Get the EDGE. **$79.95***

InfoDesigns®

Registered Trademark: Commodore–Commodore Electronics Limited. Trademarks: The Communication Edge–Human Edge Software Corporation–developed exclusively for Info Designs on the Commodore 64/128. ***U.S. Currency.**



Compiled by *SUSAN TANONA*

Telemessage

B

You Can Have this Program Custom-Designed To Fit Your Own Needs

When *RUN* decided to go online earlier this year, finding the right software for our bulletin board was one of our biggest concerns. We were looking for a highly flexible system that was also simple to set up and operate. We wanted a BBS that was friendly to our callers and wasn't too complicated to use. At the same time, we were looking for a system that could be expanded to accommodate more complex features as our needs grew.

The software that we finally decided upon was a version of Tailored Solutions' Telemessage package. Tailored Solutions does indeed live up to its name, as the company will customize the software to fit your own individual needs. (Charges range from $25–$40 for a minor change, to $150–$200 for a major overhaul.) This is a review of the BBS that Tailored Solutions provided us with, which is just one version of the commercially available package.

The flexibility and simplicity of this software was the main reason that we chose it for the RUNning Board. The option to lock out certain features was a real advantage, because it allowed us to start out with a simple system; yet we have the option to expand as our needs increase.

Along with providing callers with information about *RUN* and the computer industry, an important function of the RUNning Board is to help us obtain feedback about the magazine. Thus, the board is set up so that we can ask callers a set of questions; responses are saved to disk and later printed out in report format. The software allowed us to create question-and-answer files with a choice of three response formats: yes/no, multiple choice and open-ended. The program is compatible with Easy Script, the word processor we use to create and edit our files. (We update files weekly.)

This bulletin board system offers several other important features. You can at any time obtain mini-reports (without having to shut down the system) that give such general information as number of callers, start-up/shut-down times and dates. You can have a display on the screen as each caller uses the board, or you can deactivate the screen display completely. You have the option to password-protect your system and set start/stop times and dates in advance.

We have, however, noted a couple of problems with the software. The most serious quirk is that if the system crashes—for whatever reason—the files on the caller response disk are erased. This is due to the fact that the files are not closed until we manually shut down the system.

Also, with the original report-generator program that we received, we encountered some difficulty in printing out caller responses. The program would crash if it encountered a caller-input error. Tailored Solutions was a great help to us in working out this problem, and provided us with an updated report-generator program that included a printer-restart feature.

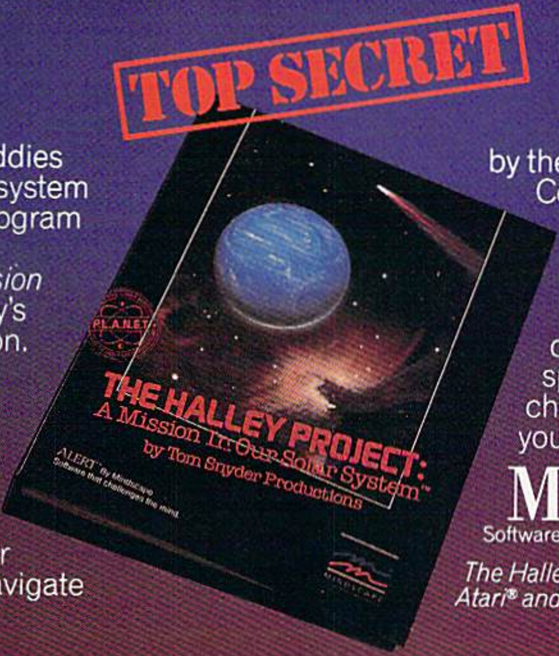
If you are looking for a serious telecommunications message system, perhaps for your business or user group, Telemessage should rank high on your list of possibilities. Whether or not you need a custom-designed system, Telemessage's many features, as well as its reasonable price, make it a package with a lot to offer. *(Tailored Solutions, PO Box 183, Washington, DC 20044. C-64/$79.50 disk.)*

Guy Wright
***AmigaWorld* staff**

Report Card

A	***Superb!*** An exceptional program that outshines all others.
B	***Very Good.*** One of the better programs available in its category. A worthy addition to your software library.
C	***Good.*** Lives up to its billing. No hassles, headaches or disappointments here.
D	***Mediocre.*** There are some problems with this program. There are better on the market.
E	***Poor.*** Substandard, with many problems. Should be deepsixed!

Just tell your friends you're going on a very long trip.


TOP SECRET
PLANET
THE HALLEY PROJECT:
A Mission In Our Solar System™
by Tom Snyder Productions
ALERT™ By Mindscape
Software that challenges the mind.

Kiss your earthbound buddies goodbye and travel the solar system in the most exciting space program ever envisioned.

The Halley Project: A Mission In Our Solar System™ is history's first real-time space simulation. Its challenge provides out-of-this-world stimulation.

Lightweight space jockeys need not apply, this one's for qualified star pilots. A rigorous ten-mission training program will test your knowledge and skill as you navigate by the stars from planet to planet.

Complete all ten missions and be invited to face the ultimate challenge: the incredible secret eleventh mission.

So take off to a software dealer and join an elite group of space explorers. As for your chums, tell them you'll wave as you fly over.

Mindscape
Software that challenges the mind.

The Halley Project is available on: Apple,® Atari® and Commodore.®

Mindscape, Inc. 3444 Dundee Road, Northbrook, Illinois 60062, 1-800-221-9884 (In Illinois 1-800-942-7315)

Copyright © 1985. Mindscape, Inc. All Rights Reserved. Apple, Atari, and Commodore are registered trademarks of Apple Computer, Atari Inc., and Commodore Business Machines.

Circle 10 on Reader Service card.

Better Working Spreadsheet

B

A Productivity Package That Will Have You Working Better in No Time

The Better Working Spreadsheet is a full-featured electronic spreadsheet with simple word processing features and the search-and-sort capabilities of a database. Superb documentation, five help screens and a handy reference card combine to make this spreadsheet a program you'll have up and working fast.

This program's greatest strength is its documentation, which is thorough and extremely readable. Features, commands and functions are presented very clearly and are supported by examples. Considerable time was put into the creation of this manual, and it shows.

The Better Working Spreadsheet offers a 250-row by 100-column format, into which you may enter numbers, text or formulas. Any changes made at one location will cause all other figures in the worksheet to be adjusted accordingly.

The program's word processing capability allows you to include additional text in your spreadsheet, but it is a limited capability—this is not a fully integrated package.

You move from cell to cell in either of two ways. You can use the cursor keys or, when working on a larger project, you may make use of the Goto option by typing ">" and the coordinates of the destination cell.

All of the commands are entered with a few simple keystrokes. You can save all or part of a given spreadsheet to disk or tape and combine any number of different spreadsheets. This program will also load any text file created by another program.

All the standard spreadsheet commands are available, such as copying and moving cell entries, inserting or deleting rows and columns, formatting cell entries and adjusting column width (1–38 characters).

But this program also offers other features, such as a command that allows you to title rows and columns so that these headings remain in place as the rest of the visible data scrolls beneath (called windowing). You can also sort any column of data alphabetically or numerically, and search for a specific entry.

You'll find more than 30 mathematical functions—from simple addition to logarithms, absolute values, a random number generator, powers, roots and trigonometric functions.

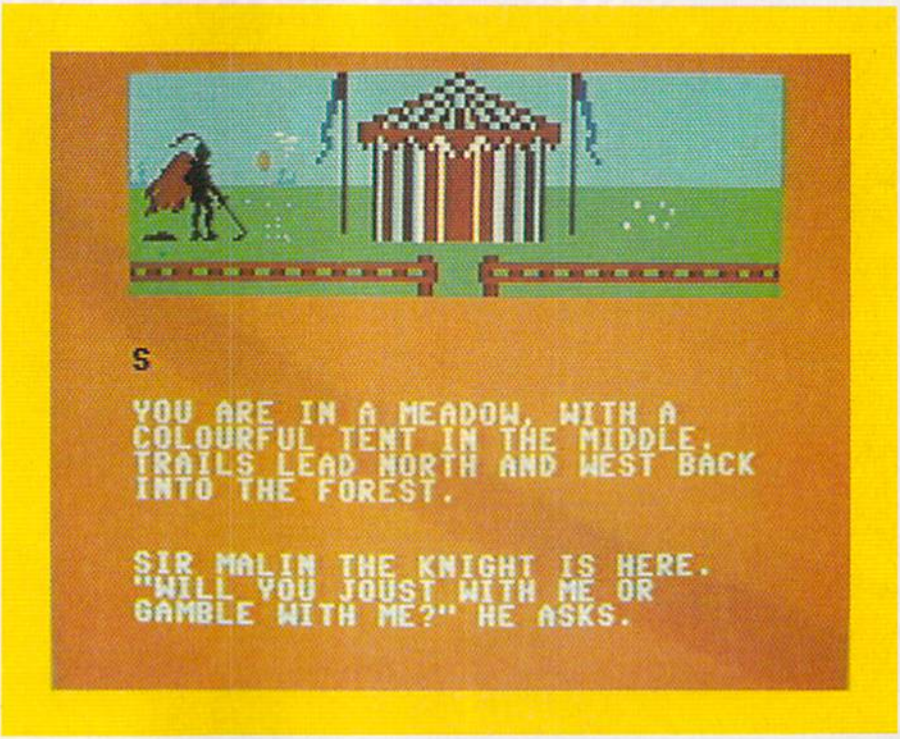
Especially useful is the If function (If. . .Then), which you enter as a formula. Capable of incorporating the logical operators (less than, greater than, and so on), this powerful feature allows you to say, "If this condition exists, do X; otherwise, do Y."

This spreadsheet offers some very advanced math functions, such as net present value and programmable iteration, which lets you do forecasting (calculating unlimited values until a given condition is met).

Of course, the ultimate beauty of a spreadsheet program is the option to print out a hard copy of your work, and the Better Working Spreadsheet allows you to do this with any properly interfaced Commodore-compatible printer. The program can also print out your data in the form of a high-resolution bar graph.

This spreadsheet is easy to use and is loaded with features. Its documentation ranks with the very best I've seen. Commodore 64 owners should welcome the Better Working series of home and small-business software with open arms. Bravo, Spinnaker! *(Spinnaker Software, One Kendall Square, Cambridge, MA 02139. C-64/$49.95 disk.)*

Ken Silverstein
Salem, NH



```
S

YOU ARE IN A MEADOW, WITH A
COLOURFUL TENT IN THE MIDDLE.
TRAILS LEAD NORTH AND WEST BACK
INTO THE FOREST.

SIR MALIN THE KNIGHT IS HERE.
"WILL YOU JOUST WITH ME OR
GAMBLE WITH ME?" HE ASKS.
```

Eureka!

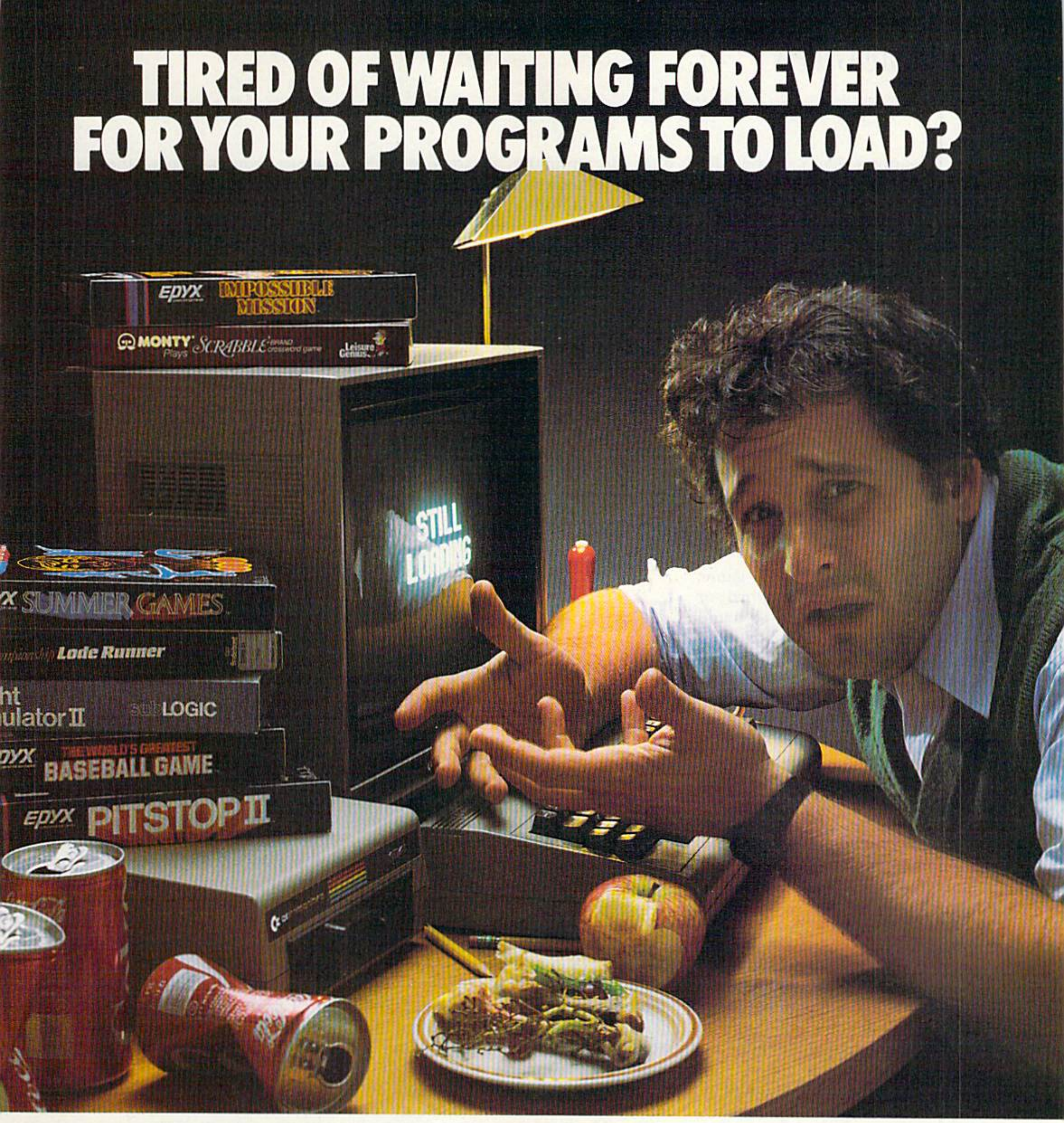
B

A Larger-than-Life Game To Challenge even the Most Seasoned Adventurer

Subtitled "250K of Pure Mystery," Eureka! is perhaps the grandest attempt yet in adventure gaming. But the key word here is attempt.

The scenario is this: The Temporal Talisman (a crystal cube) was brought back from the moon by one of the Apollo missions. Under examination by powerful lasers, the cube shattered into eight pieces. Three were found rather quickly, scattered about the globe, but you must locate and retrieve the other five. Unless you do, the moon will disintegrate and shower the earth with meteors.

TIRED OF WAITING FOREVER FOR YOUR PROGRAMS TO LOAD?


EPYX IMPOSSIBLE MISSION
MONTY Plays SCRABBLE
Leisure Genius
SUMMER GAMES
Championship Lode Runner
Flight Simulator II subLOGIC
EPYX THE WORLD'S GREATEST BASEBALL GAME
EPYX PITSTOP II
STILL LOADING

INTRODUCING THE FAST LOAD CARTRIDGE FROM EPYX.

You're tired of waiting forever for your Commodore 64 programs to load. But it's no use glaring at your disk drive. Calling it names won't help, either. It was born slow—a lumbering hippo. You need the FAST LOAD CARTRIDGE from EPYX. FAST LOAD transforms your Commodore 64 disk drive from a lumbering hippo into a leaping gazelle. With FAST LOAD, programs that once took minutes to load are booted up in a matter of seconds.

FAST LOAD can load, save and copy your disks five times faster than normal. It plugs into the cartridge port of your Commodore 64 and goes to work automatically, loading your disks with ease. And that's only the beginning. You can copy a single file, copy the whole disk, send disk commands, and even list directories without erasing programs stored in memory.

And unlike other products, the FAST LOAD CARTRIDGE works with most programs, even copy protected ones, including the most popular computer games.

The FAST LOAD CARTRIDGE from Epyx. Easy to insert, easy to use and five times faster. So why waste time waiting for your disks to load?

Speed them up with FAST LOAD!

Circle 12 on Reader Service card.

EPYX
FOR COMMODORE 64
Fast Load
CARTRIDGE
LOADS DISKS 5 TIMES FASTER
WORKS WITH MOST POPULAR PROGRAMS
EASY TO USE

EPYX™

The remaining pieces of the talisman have been scattered through time. Each area of search is a text-and-graphics adventure.

If all this seems made up of elements from *The Time Machine*, "Dr. Who" and James Bond, you're probably right. And with such illustrious antecendents, how could Eureka! possibly go wrong?

One main drawback is that the documentation is too sketchy. A list of single-key commands is given (such as S for south and N for north), but that's as far as it goes. When playing an adventure, I want to be able to concentrate on the large mystery of the game, not the smaller mysteries of discovering which words the parser will understand.

Life is rather short in this game; while trying to find the word or words that will allow me to avoid jousting with the black knight, I am run through by his lance. A partial listing of commands would have made this adventure more enjoyable.

Besides the five text adventures, there is an arcade game that you must play in order to acquire vigour—what we on this side of the ocean would call strength. Vigour is necessary for combat and survival. However, you are on your own in discovering how to play the arcade game, because the description in the documentation bears no resemblance to what I found on my screen.

The Eureka! manual contains a picture and a riddle for each adventure, and you must work with all three elements simultaneously if you are to have any hope of solving the mystery.

Each chapter, or adventure, is a mystery in and of itself, yet it is only a small part of the grand mystery. As you search for the crystal pieces, you should also be collecting clues toward the ultimate solution.

Knowledge gained in the early adventures will help you solve the later ones, and you can piece together the clues to yield a telephone number and a secret code. Be the first to call the London number and speak the code, and you'll be rewarded with a prize of $25,000.

Because the graphics never occupy more than one-third of the screen (and frequently less), you'll strain hard for visual clues. Yet I must say that the animation in some of the frames is superb and the sound is terrific—a lonely wind whistles through Sherwood Forest and hoofbeats resound during the joust.

In summation, Eureka! is a grand attempt that falls short because of poor documentation. Hardened adventurers may love it, but beginners will find it extremely frustrating to keep dying after only a few moves. This is, indeed, mystery on an ambitious scale. *(Handic Software, 400 Paterson Plank Road, Carlstadt, NJ 07072. C-64/$39.95 disk.)*

Ervin Bobo
St. Peters, MO

Beach Head II C

This Sequel Never Quite Matches the Excitement Of the Original

After months of anticipation fueled by magazine ads in the style of movie posters, Access Software has finally released Beach Head II. This is the sequel to what many consider to be the best arcade-style contest of military might. Not only did the original Beach Head set a standard for programming excellence, but the completeness and continuity of the game's story line elevated it way above the level of a simple shoot-'em-up.

Unfortunately, like most movie sequels, Beach Head II never quite lives up to the original production.

Picking up the story where Beach Head leaves off, Beach Head II pits the heroic commander of the Allied forces against the evil dictator, known to his friends as the Dragon. The four-part Allied mission is to storm the Dragon's sanctuary, rescue the hostages captured during previous battles and fly a daring helicopter mission to get them off the island. Finally, the Dragon must be eliminated in a deadly showdown.

In all but the helicopter escape sequence, you may play the part of either the Allied commander or the Dragon by choosing the appropriate joystick. The computer will automatically take control of the other side. There is also a two-player option that lets you battle it out against a friend.

The game features some nice voice simulation. For example, when Allied troops are gunned down by the Dragon's machine gun, they call for the medics, yell, "I'm hit" or simply groan in pain.

Easily the best of the game's sequences, this Attack screen features several soldiers realistically parachuting from a helicopter, climbing over walls and hurling hand grenades at the Dragon's machine gun.

In the second sequence, the Allied forces have captured the Dragon's machine gun and must use it to protect escaping prisoners as they walk across a courtyard. If you're quick enough, you'll be able to help the prisoners make it to safety. (If you've seen the game called Crossbow, this scene will seem awfully familiar.)

The third scenario is an unimaginative scrolling shoot-out between the Allied helicopter and the dictator's tanks and automated defense system. This sequence uses no voice simulation, and the scenery, though colorful, is nothing out of the ordinary.

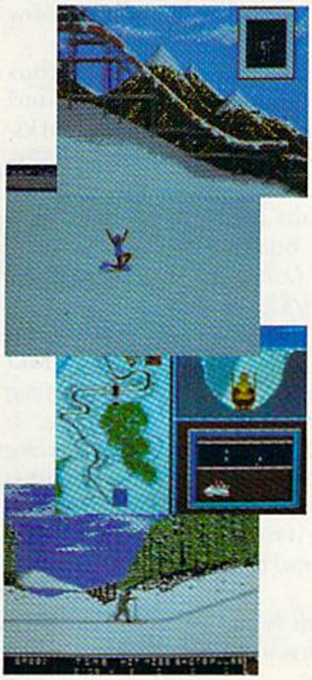
The grand finale features the commander and the dictator hurling poontas (an ancient weapon) at each other from opposite sides of an underground river. Although the graphics on the board are very well done, and I understand the drama the designers were attempting to create with a one-on-one showdown between good and evil, there is something anticlimactic about two great military leaders settling the score with sharpened sticks.

If you liked the original Beach Head, you'll probably be bored with Beach Head II. The game's four sequences are related only by the instruction booklet, and they lack the depth and strategic elements found in the predecessor. Beach Head II may talk, but the original had a lot more to say. *(Access Software, 925 East 900 South, Salt Lake City, UT 84105. C-64/$39.95 disk.)*

Bob Guerra
Charlestown, MA

WINTER GAMES.™ THE QUEST FOR THE GOLD CONTINUES...

WIN a Tahoe ski week! Special sport and ski-wear offer.*



You've captured the gold in Summer Games® and Summer Games II™. Now it's on to the *Winter Games*! And what an incredible setting—a completely realistic winter wonderland featuring *seven* action-packed events.

At the Ski Jump you control your form in mid-air, knees straight, leaning forward. Hot Dog Aerials challenges your courage *and* your sense of humor. In Figure Skating you leap into Double and Triple Lutz jumps—wow the crowd with a perfect Camel into a Sit Spin. It's timing and style that counts. Free Skating lets you choreograph your own routines. In Speed Skating it's you against a fellow speed demon—the fastest human beings on level earth! And the Bobsled—still faster as you fly around hairpin turns, leaning hard to stay in the tube. Finally the Biathlon, the ultimate challenge to your endurance in cross-country skiing and marksmanship.

All of this fun and excitement is easy to learn and play. You control the action with the joystick, animating your player for style and rhythm. You choose the country you want to represent. Listen to its national anthem. Then it's practice, training and learning a winning strategy for each event. Now the *Opening Ceremony* and the competition begins—against your friends or the computer. Will you be the one who takes the gold at the *Awards Ceremony*? Will your name be etched amongst the *World Record* holders?

The quest for the gold continues... And it's all here—the strategy, the challenge, the competition, and *pageantry* of Winter Games!

	APPLE	MAC	C64/128
Winter Games	✓	✓	✓

EPYX®
COMPUTER SOFTWARE
1043 Kiel Ct., Sunnyvale, CA 94089

Strategy Games for the Action-Game Player®

EPYX
WINTER GAMES

* See specially marked boxes for details. No purchase necessary. Sweepstakes ends Dec. 31, 1985. Official rules available at participating dealers.

Circle 12 on Reader Service card.

WOODBURY
Presents
PLAY WRITER
ADVENTURES
IN SPA

PlayWriter/ Adventures in Space

A

Your Child Can Write, Print Out, Design and Bind A Personalized Storybook

An old Arabian proverb has it that before a man dies he should plant a tree, write a book and raise a son. You can give your children a head start on one of these with PlayWriter/Adventures in Space, for everything is here to create a finished, hardcover book with four-color illustrations.

Completely menu-driven, with prompted multiple choices at every step of the way, PlayWriter will provide a good outlet for your child's imagination and a book that is both readable and interesting.

At the beginning, you are asked to choose a title for your book. Select one of the two offered or create your own. Next, you are prompted to enter your first and last name. This creates your byline.

Like text adventures, where opening one door reveals more doors to be opened, the multiple choices offered in PlayWriter lead to an almost infinite number of possible events. Because it is unlikely that you or your child will always make the same choices, you will probably never write the same story twice.

Stories may be saved to disk (two on the master disk and more on a blank disk).

You may be asked to decide the criteria by which a space adventurer is chosen. Three choices are printed on the screen and the Other option allows you to make up your own. A paragraph will then be built around your character, and it will be remembered in subsequent chapters.

My daughter chose "awesome" as her favorite exclamation of surprise and delight. Her heroine then goes through the story saying "awesome" as new surprises present themselves. In the writing of fiction, repetition of a trait helps define a character, and so it is here. If you forget to be consistent in your answers, the program will provide at least a small measure of consistency for you—a nice touch.

When a chapter ends, you can edit that chapter or, if the creative juices are still flowing fast, go right on to the next.

Should you decide to edit, it will be at this point that you can first read your fleshed-out story. A rudimentary word processor allows you to correct spelling or completely alter the course of your story. But a word of warning—if you decide to change "awesome" to "wow," you'll have to do it for every occurrence, as search and replace is not a function of this program. Editing is done one paragraph at a time.

You may print to plain paper, to plain paper in book format, or, if you're really sure this is the best you can do, print to the 5- × 7-inch perforated paper included in the package. It is this that will be bound into your book.

In the blank spaces of your manuscript, you may insert the colorful stickers provided (or any other stickers you choose). For prolific writers, paper and sticker refills are available from Woodbury.

Because there are so many choices, and because your choices must be digested by the story-making machinery, there are times when the disk must be accessed for new material. To help ease the boredom while waiting, a riddle appears on the screen, and youngsters can mull over their answers while the mundane tasks are being done—another nice touch, proving these people really know their audience.

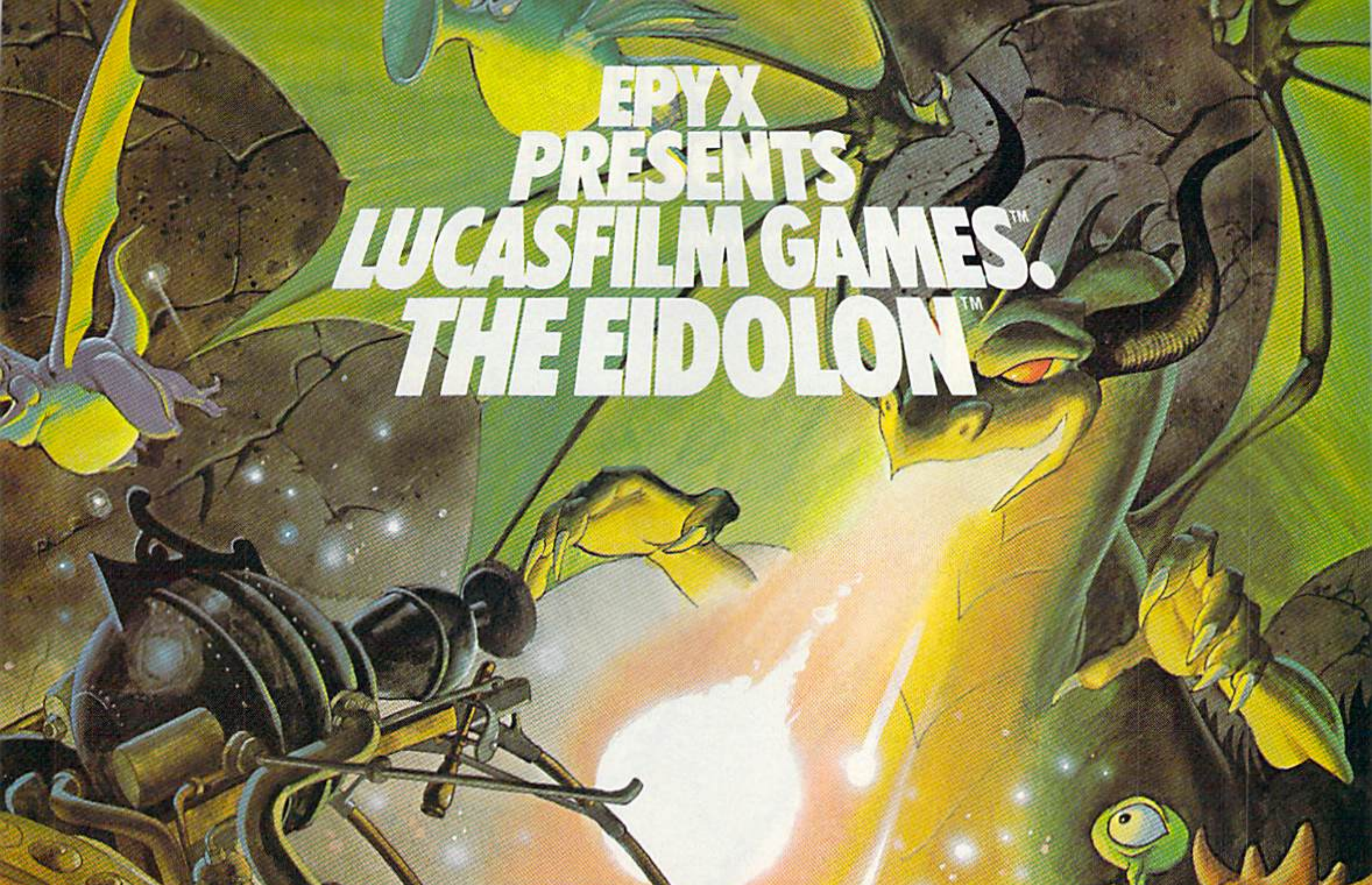
For its ease of use and its obvious educational value, I give PlayWriter/Adventures in Space high marks. And I was even more pleased that its use of real tools from the craft of fiction results in so readable and interesting a book. *(Woodbury Software, 127 White Oak Lane, Old Bridge, NJ 08857. C-64/$39.95 disk.)*

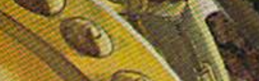
Ervin Bobo
St. Peters, MO

Editor's note: Woodbury Software, along with Grolier Electronic Publishing, is sponsoring The Great American Writing Contest, a competition for children that is based on the PlayWriter series of programs. PlayWriter/Adventures in Space will be assigned to students in grades four and up.

Stories will be judged on content, originality, grammar, spelling and overall ef-

Continued on p. 144.


EPYX PRESENTS LUCASFILM GAMES.™
THE EIDOLON™
WIN a day at Lucasfilm! Special sweepstakes offer.*



© 1985 LFL.

You've just discovered the Eidolon—a curious 19th century machine whose inventor vanished without a trace. Only his journals and sketches remain. They tell of an incredible magical realm—a maze of caverns populated by strange creatures noted as Greps, Biter Birds and Bottlenecks. And "intelligent" Guardian Dragons—who hurl colored fireballs of energy?

The machine itself belies its quaint Victorian charm. For the Eidolon glows with the power of enchanted energy. It awaits, pristine and gleaming—perfectly preserved for over a hundred years by the powerful forces that propelled it and its pilot to another dimension.

With the fascinating first-person point of view, you can climb into the pilot's chair and fly this mysterious magical machine. And the haunting fractal graphics take you deeper and deeper into an endless maze of mystical caverns.

An adventure so real, it'll make you wonder: What ever happened to the Eidolon's mysterious inventor? Only the adventurous of spirit will know his fate. The Eidolon—scientific curiosity, or passport to a magical dimension?

	C64/128	ATARI	APPLE
The Eidolon	✓	✓	✓

© 1985 LFL.

EPYX
LUCASFILM GAMES.
THE EIDOLON

© 1985 LFL.

* See specially marked boxes for details. No purchase necessary. Sweepstakes ends Dec. 31, 1985. Official rules available at participating dealers.

EPYX®
COMPUTER SOFTWARE
1043 Kiel Ct., Sunnyvale, CA 94089

Strategy Games for the Action-Game Player®

Lucasfilm Games, The Eidolon, and all elements of the game fantasy: TM & © 1985 Lucasfilm Ltd. (LFL). All Rights Reserved. Epyx, Inc., Authorized User. ®: Registered Trademarks of Epyx, Inc.

Circle 12 on Reader Service card.

Introducing the Most Powerful Business Software Ever!

FOR YOUR IBM • APPLE • MAC • TRS-80 • KAYPRO • COMMODORE • MSDOS OR CP/M COMPUTER*

50% OFF!

VERSA PAYABLES
VERSA INVENTORY
VERSA RECEIVABLES
PAYROLL SIMPLIFIED
VERSA PAYROLL
Tired Of Your GENERAL LEDGER?
VERSA LEDGER

The VERSABUSINESS™ Series

Each **VERSABUSINESS** module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

Circle 9 on Reader Service card.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

FOR COMMODORE OWNERS ONLY!

Commodore owners *only* may now take 50% off our listed price of any module(s) from our VersaBusiness Series. All sales are final (our normal 30-day money back guarantee does not apply to sale items).

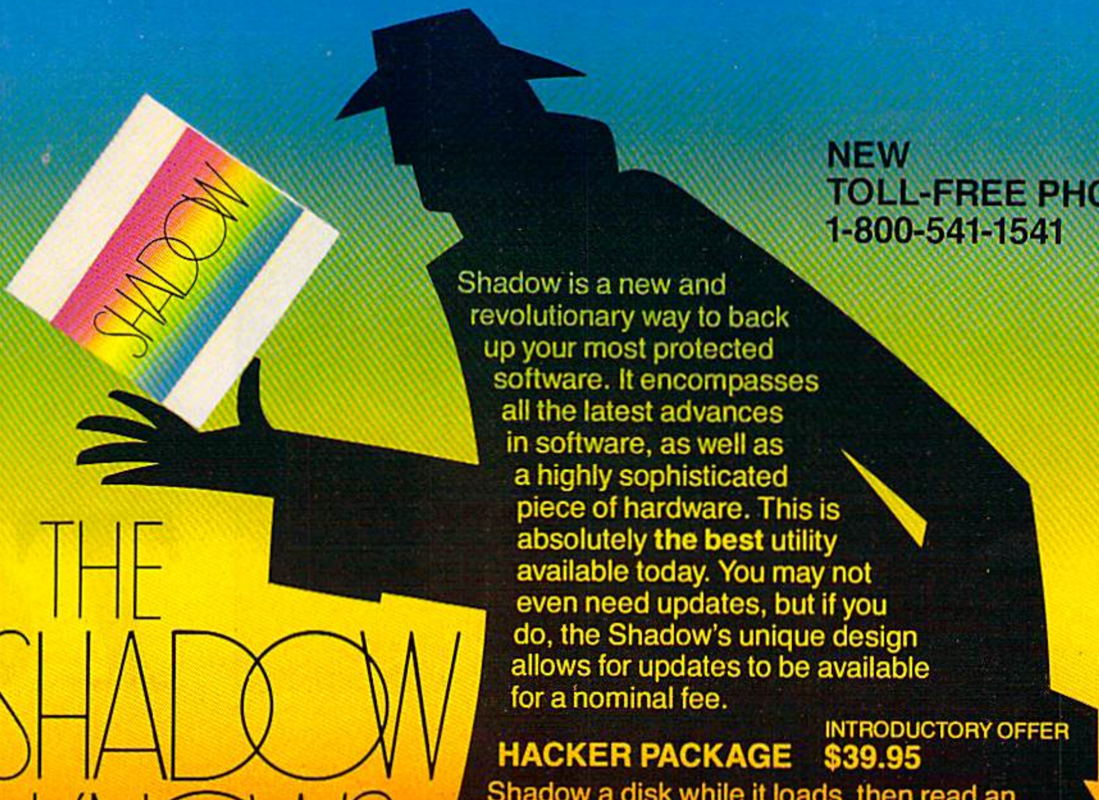
To Order:
Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

Circle 189 on Reader Service card.



NEW TOLL-FREE PHONE 1-800-541-1541

Shadow is a new and revolutionary way to back up your most protected software. It encompasses all the latest advances in software, as well as a highly sophisticated piece of hardware. This is absolutely **the best** utility available today. You may not even need updates, but if you do, the Shadow's unique design allows for updates to be available for a nominal fee.

HACKER PACKAGE INTRODUCTORY OFFER **$39.95**

Shadow a disk while it loads, then read an exact list of:

- Track, sector, ID, check sum, drive status
- High and low track limits
- Density use on each track
- Half tracks that are used
- Command recorder shows exact commands that were sent to the 1541 while program was loading
- RAM recorder records custom DOS

Shadow-scan any disk, then read exact list of:

- Valid tracks, half tracks, partial tracks and segments
- Sync mark links, header block links, and data block links
- Track to track synchronization

Exclusive snap shot recorder will give you an exact copy of the 1541 RAM and can be viewed, saved or printed. Plus many more features included.

GT PACKAGE INTRODUCTORY OFFER **$39.95**

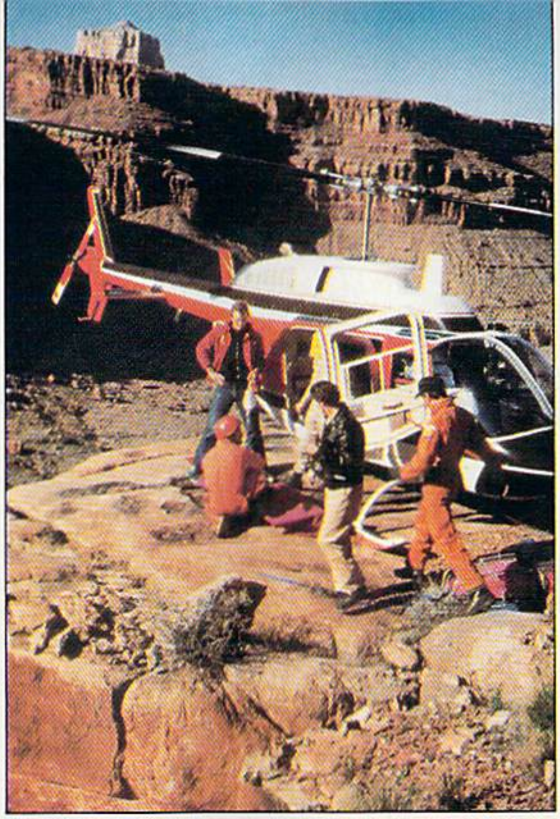
Highly sophisticated and integrated piece of hardware that turns your 1541 into something you've always wanted.

- Track and sector display
- Drive reset switch
- Device number change
- Half track indicator
- Abnormal bit density indicator
- Shadow on-off indicator

The Shadow display will give you an accurate display of precisely what track you are accessing during a normal load even if the program does a read past track 35.

Order by phone 24 hrs./7 days or send cashier's check/money order payable to Megasoft. Visa, MasterCard include card # and exp. date. Add $3.50 shipping/handling for continental U.S., $5.50 for UPS air. CODs add $7.50, Canada add $10.00. Other foreign orders add $15.00 and remit certified U.S. funds only. Distributors invited and supported.

MegaSoft LTD
P.O. Box 1080 Battle Ground, Washington 98604 1-800-541-1541



NATIONAL PARK SERVICE

To

"It's a sign of the times: Computers are being used effectively in a variety of situations. And if we're really going to do our job of search-and-rescue, we have to use a computer, especially in large-scale operations."

Sgt. Charles McHugh
Former Search-and-Rescue Coordinator
Pima County Sheriff's Dept.
Tucson, AZ

By S.F. TOMAJCZYK

Rescuers out west are enlisting the aid of a unique Commodore program that helps locate missing persons. Its remarkable success rate has even captured the interest of the U.S. Navy and Air Force.

As any rescuer can readily attest, finding a lost person can be both frustrating and difficult. That's because people are unpredictable; they cross highways, walk in circles, don't signal for help, and so on.

It's therefore not surprising that in this real-world game of hide and seek, the chances of locating lost people before it's too late have always been slim. Searchers have usually been forced to rely more on their so-called seat-of-the-pants judgment than on any other rescue methods.

But, thankfully, time has a way of changing things. Today there is a way for searchers to combine gut feeling with hard evidence to find the elusive victim—a marriage of the Commodore 64 to a computer program by the name of CASIE.

In a Nutshell

CASIE (Computer-Assisted Search Information Exchange) is a Basic program that uses available search data to determine the *probability* of finding a lost person in a certain location; it *does not* actually find the victim. This probability of detection, referred to as the POD, is instrumental in helping the search manager decide where to look for the person and with what means (e.g., dog teams, helicopters, infrared devices, ground crews).

For instance, CASIE might determine through available information that there's a 57% chance of finding the lost person in a specific river area. Therefore, the search manager would be inclined to search that region before any others. And because there's water, the manager would probably decide to send in a helicopter rather than a dog team, knowing that the river might have erased traces of the missing person's scent.

CASIE is the brainchild of Dr. John Bownds, a research member of the Oak Ridge National Laboratory, and Dr. David Lovelock, a mathematician at the University of Arizona. Their interest in the application of probability theory and computers in locating lost people stems from their own

COMMODORE THE RESCUE!

involvement with search and rescue—Bownds as a field operator and Lovelock as a radio operator—in the Tucson, Arizona, area during the late 1970s.

The seed for CASIE was planted in 1979 by Sgt. Charles McHugh, then Search and Rescue Coordinator of the Pima County Sheriff's Department. He approached Bownds and Lovelock about some literature that he had picked up at a seminar given by the National Park Service.

The literature speculated on the future role of computers in rescue operations. After reviewing the information, both men felt that the presented data was accurate and that they could develop it into a computer program.

The opportunity to back up their words happened in 1980, when Bownds was hospitalized for meningitis, contracted during a rescue mission in the Sonoran Desert. While recuperating, he developed the CASIE prototype on a TI-59 programmable calculator that his wife had bought him.

"CASIE ran around inside my head while I was hospitalized," Bownds said. "As a physical and mental exercise, I learned how to program the calculator; CASIE finally came out."

Lovelock subsequently translated Bownds' TI-59 efforts into Basic on his Commodore 64. According to Lovelock, he and Bownds selected Basic for two reasons: It's easy to program and to teach people.

Looking for the Numbers

In typical localized search missions, where the victim is usually found within just a few hours of having been reported missing, CASIE is not normally used. That's because the program in its present state would be more of a hindrance than an aid (much like using a chain saw when a handsaw would suffice).

However, when an extensive search operation involving hundreds of people and aircraft is required to find a missing victim, CASIE works like a charm. Such large-scale rescue missions are usually launched when the victim has been lost for several days or when the search manager senses from the start that finding the person is going to be difficult, due to the weather or terrain.

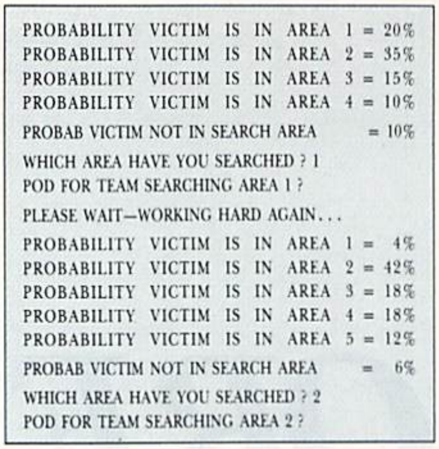
In these instances, all the rescuers are brought together for a conference. The facts of the case are discussed and a decision is made on how to segment the search area; then a consensus is taken on the POD of actually finding the victim in any one of the search grids. If it's done properly, the sum of all the sector PODs adds up to 100 percent.

These quasi-subjective POD figures are then fed into CASIE to calculate a maximum, minimum and average POD for each search sector. With this in hand, the search manager has a better idea of where the victim might be found. He can then distribute his search forces more wisely and accurately.

"We once created a program on the Commodore that depicted the POD figures by color," mentioned Lovelock. "A shade of red in a search grid indicated a high probability of finding the victim there; blue indicated a low probability. It *looked* great, but John and I quickly decided to go back to our old way. Seeing a number like 82.6 percent meant more to us than seeing bright red. Besides, who can tell the difference between an 82-percent red and an 83-percent red?"

Throughout the rescue mission, Lovelock and Bownds can be found in the command center playing "scenarios," a never-ending game of asking, "What if. . ." (e.g., "What if the victim is injured and unable to move? How will this affect the POD figures for each of the search grids?").

Answering these questions and continually updating the POD figures as information from the field reaches the command center gives the search manager a better idea of what he's confronted with and helps prepare him for any sudden changes that might occur. (The discovery of footprints, for example, would have



```
PROBABILITY  VICTIM  IS  IN  AREA  1 = 20%
PROBABILITY  VICTIM  IS  IN  AREA  2 = 35%
PROBABILITY  VICTIM  IS  IN  AREA  3 = 15%
PROBABILITY  VICTIM  IS  IN  AREA  4 = 10%
PROBAB VICTIM NOT IN SEARCH AREA      = 10%
WHICH AREA HAVE YOU SEARCHED ? 1
POD FOR TEAM SEARCHING AREA 1 ?
PLEASE WAIT—WORKING HARD AGAIN . . .
PROBABILITY  VICTIM  IS  IN  AREA  1 =  4%
PROBABILITY  VICTIM  IS  IN  AREA  2 = 42%
PROBABILITY  VICTIM  IS  IN  AREA  3 = 18%
PROBABILITY  VICTIM  IS  IN  AREA  4 = 18%
PROBABILITY  VICTIM  IS  IN  AREA  5 = 12%
PROBAB VICTIM NOT IN SEARCH AREA      =  6%
WHICH AREA HAVE YOU SEARCHED ? 2
POD FOR TEAM SEARCHING AREA 2 ?
```

Figure 1. *Sample of CASIE printout.*

a dramatic effect on the POD for the sector in which the prints were found.) It's not uncommon for the rescue mission to suddenly be redirected to another sector after such efforts, often with success.

At the end of each day, CASIE is used to generate a report on the cumulative and daily search progress (i.e., changing POD figures for each search grid), so that rescue personnel can see and confirm the results of their efforts. This is an invaluable aid when the search continues beyond a few days.

"If the search for a missing person goes on for a long time," explained Lovelock, "everyone gets very tired and emotionally drained, especially when there's a child involved. At times like these, it's nice to have a computer that isn't tired or emotionally involved and that just generates the numbers.

"It's reassuring that the numbers come out the same way the search manager feels they should; it has a stabilizing effect and keeps the manager honest before he makes the decision to call off the search. You see, very few people—other than scientists—have the ability to live in a vacuum."

Searching High and Low

To date, CASIE has been used extensively in search-and-rescue missions from the Sonoran Desert to the Grand Canyon, and has managed to find 90 percent of the people reported lost or missing.

In one notable instance concerning a woman lost in the Grand Canyon in midwinter, CASIE recommended that the search teams look in an area that most of them hadn't really considered as being a likely spot for the woman to be found: a steep and narrow canyon. A search team was sent in to investigate, and, lo and behold, there she was—cold but alive.

Such an impressive batting average has caused many people to believe erroneously that CASIE can find anybody or anything that's lost. However, as Lovelock readily points out, CASIE's accuracy is based on two factors: the quality of the information put into the program (the old garbage-in, garbage-out theory) and the effectiveness of the search teams.

With reliable information and search teams, though, CASIE can do wonders. The program has been used to help determine the whereabouts of crime victims (in this instance, a nine-year-old child who was murdered) and also escaped criminals. Bownds and Lovelock were even recently approached by military representatives who had heard about CASIE's list of accomplishments.

"The Navy," said Bownds, "has expressed interest in CASIE from the point of view of trying to hook it into their on-board computers searching for underwater targets like submarines—our own and the enemy's. And Scott Air Force Base, which is the central rescue center in the United States, has expressed *great* interest in developing this computer system to locate downed planes and boats."

Other potential applications for CASIE—with the proper changes and modifications—include helping to find American MIAs in Vietnam or missing children here in the United States. It's important to note, however, that such speculations and ideas are presently just that: purely speculative.

"I would imagine that given the right scenario, yes, we could be useful over there in Vietnam," said Lovelock. "But it's the same as anything else; if you don't have a gut reaction as to what's happened, then it's unlikely that we can program it. In other words, if you've got a lot of experience and the signs don't mean a thing to you, then it's unlikely we'll be able to put anything into the computer that makes sense out of it."

Future Plans

CASIE's development is the proverbial never-ending story: Bownds and Lovelock are forever tinkering with the C-64 version of CASIE to make it more powerful and more intelligent. And Bownds is taking this even one step further: He's currently attempting to raise funds to build a prototype CASIE expert system.

"What we're trying to do is apply the CASIE program nationwide," he said. "The system we envision will be a computer network with a mainframe at its center. The mainframe will do all the calculations for the information exchange and send by modem the updated search information for the search management team to review.

"The size and speed of the mainframe will allow for several rescue missions to be coordinated at once. Right now, there are only two people who can operate CASIE: David and me. And we're doing a lot of work that the program should be doing instead. By nationalizing CASIE and making it more intelligent—hopefully to the point where it begins to learn from its own experiences—we can have a very sophisticated program, capable of simultaneously and accurately finding numerous victims in different parts of the country.

"If that can happen," Bownds continued excitedly, "all a search manager will have to do is phone into the network system via computer and modem, input the details of the search-and-rescue mission at hand and then wait for CASIE to do the computations and send back the results. He doesn't have to know any mathematics at all."

Bownds is convinced that such a nationalized search-and-rescue expert system is not too far in the future. In fact, he predicts that with proper funding, he and Lovelock could have a prototype network up and running in two *very* intense years. And he foresees a fully operational expert system to be in existence by the turn of the century.

Indeed, a bright future appears to lie ahead for CASIE, whether in locating missing children or tracking down enemy submarines. Granted, to eventually become a reality, this development process will require hard work and self-sacrifice on the behalf of Dr. Lovelock, Dr. Bownds and many other people, but they are determined to make it a reality. The Commodore User's Club in Tucson, Arizona, for example, has already raised over $3500 for CASIE, with the goal of achieving a total of $25,000.

And for those in the lost-and-found business, seeking and discovering alternatives is what it's all about. R

S.F. Tomajczyk is an author-journalist whose articles have appeared in a variety of national publications.

Circle 2 on Reader Service card.

IF YOU CAN FIND A BETTER PROGRAM WE'LL BUY IT FOR YOU!*

TIMEWORKS
Word Writer
TIMEWORKS
Word Writer with Spell Checker
128
TIMEWORKS
Data Manager 2
TIMEWORKS
Data Manager
128
TIMEWORKS
SwiftCalc
128
SIDEWAYS
TIMEWORKS
SwiftCalc
SIDEWAYS

WORD WRITER with Spell Checker

Now with 85,000 word Spelling Checker

- An efficient, 80-column professional word processing system which includes a spelling checker and built-in calculator.
- Contains all the features you'll need for everyday word processing, plus most of the sophisticated features found in more expensive programs: document chaining, form letter printout, page separations, horizontal and vertical scrolling, and more.

With Timeworks you get more power for your dollar

You can use each program alone. Or interface this trio – one at a time if you like – into a completely integrated productivity system that delivers all the power and features most of you will ever need . . . at a cost that lets you enjoy their use.

Look for these and other Timeworks programs at your favorite dealer. Or contact Timeworks, 444 Lake Cook Road, Deerfield, IL 60015. Phone: (312) 948-9200.

DATA MANAGER 2

Faster, more efficient, more versatile

- A complete general information storage and retrieval system with report-writing, graphics, statistics, and label-making capabilities.
- Exclusive X-SEARCH, X-SORT, and X-CHART features allow you to cross-search any category of information; sort items alphabetically, numerically, or by date; break down statistical information into categories; and graphically view your results.

With Timeworks you get more than software

You Get Our Customer Technical Support Team

At the other end of our toll-free hotline, you'll find our full-time Customer Technical Support Team. Free of charge to all registered users.

You Get Our Liberal Trade-Up Policy

You'll find the details inside each package.

SWIFTCALC with SIDEWAYS

New easy-to-use spreadsheet for home and small business use

- The SIDEWAYS option lets you print all your columns on one, continuous sheet . . . sideways.
- 250 rows and up to 250 columns (128K version) provide up to 62,500 cells (locations on the spreadsheet) in which to place information.
- Performs mathematical functions up to 17 digits. Allows the use of minimum and maximum values, averages, sums, integers, absolute values and exponential notation.

*With Timeworks you get our Money Back Guarantee

If you can find anything that works better for you, simply send us your Timeworks program, your paid receipt, and the name of the program you want, along with your check or credit card number for any retail price difference. If it's available, we'll buy it for you.**

For Apple, IBM, Commodore 128 (128K) & Commodore 64 Computers

TIMEWORKS®

More power for your dollar.

Other Timeworks Programs:

- The Evelyn Wood Dynamic Reader
- Sylvia Porter's Personal Finance Series
- Swiftax
- Cave of the Word Wizard
- Business Systems
- Wall Street
- The Electronic Checkbook
- The Money Manager

These programs interface with each other

Now available for Commodore 128

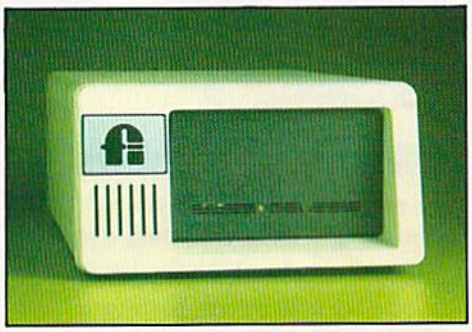
** Offer valid for 90 days from date of purchase.

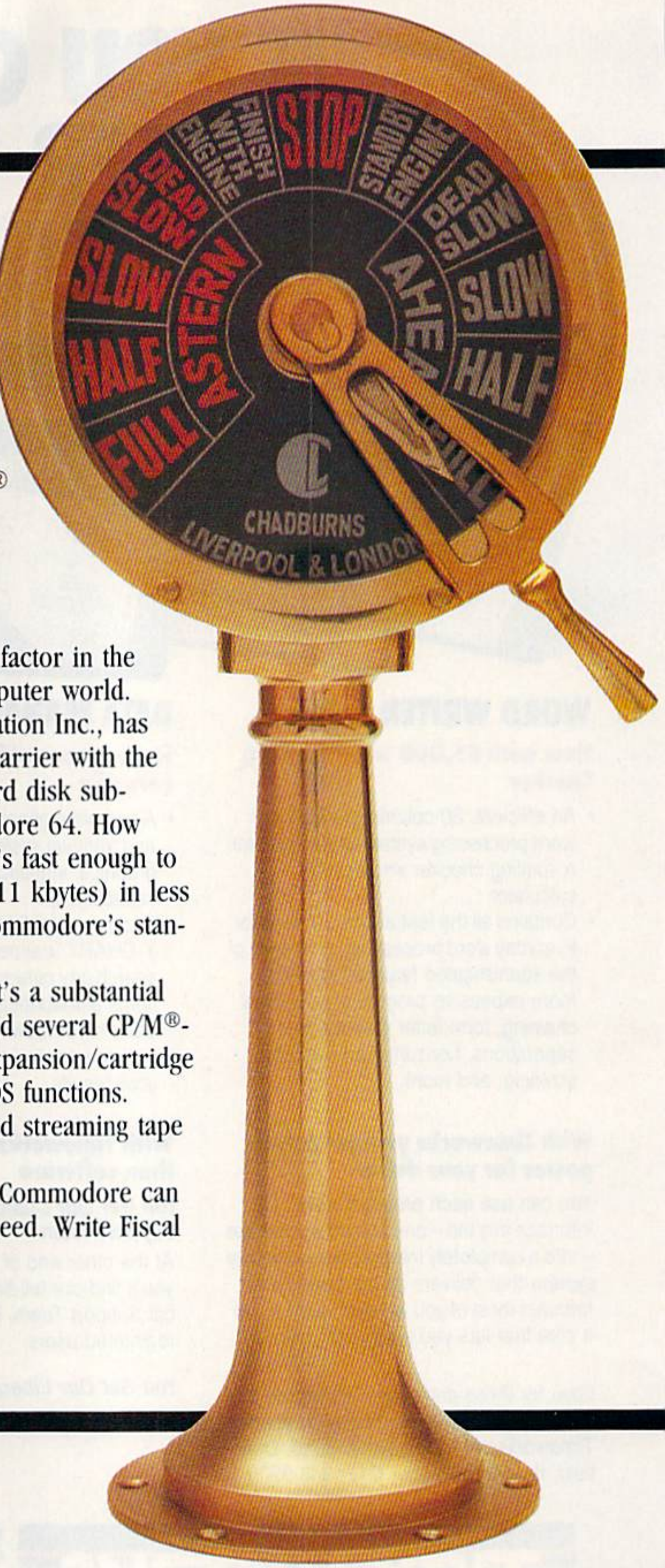
*** Registered trademarks of Apple Computer, Inc., International Business Machines Corporation, and Commodore Computer Systems

© 1985 Timeworks, Inc. All rights reserved.

Circle 80 on Reader Service card.

New Hard Disk Signals Full Speed Ahead For Commodore 64®





Speed. It's a major factor in the business microcomputer world. Now, Fiscal Information Inc., has broken the speed barrier with the first **really fast** hard disk subsystem for Commodore 64. How fast is really fast? It's fast enough to load a full screen of high-resolution color graphics (about 11 kbytes) in less than one second! It is, in fact, up to 43 times faster than Commodore's standard 1541 floppy disk drive.

FII's **Lt. Kernel**™ disk drive carries an on-board DOS. It's a substantial upgrade to C64's BASIC, since it adds run-time functions and several CP/M®-like command line functions. Lt. Kernel interfaces via the expansion/cartridge port and transparently implements all Commodore 1541 DOS functions.

Capacity of 10 or 20 MB is standard; larger capacities and streaming tape backup are available as extra-cost options.

Price of the 10 MB Lt. Kernel is $1,595. Learn how your Commodore can sail into serious business or scientific applications at full speed. Write Fiscal Information Inc., or telephone 904/253-6222.

FISCAL INFORMATION INC.

143 Executive Circle / Daytona Beach, FL 32014
P.O. Box 10270 / Daytona Beach, FL 32020

Commodore 64 is a trademark of Commodore Business Machines.
CP/M is a trademark of Digital Research, Inc.
Lt. Kernel is a trademark of Fiscal Information, Inc.

Fleet System 2.™
Word processing that *spells* V-A-L-U-E.

"★★★★"
— *Family Computing*
For C-64 and C-128
Full Support of Commodore 128 Mode!

Complete word processing with built-in 90,000 word spell checking - Only **$79.95**

Up till now, you'd have to spend a minimum of about $70 to get a good word processor for your Commodore 64™/128™. And if you added a small, *separate* spell checking program, you'd be out well over $100!

Now there's Fleet System 2! It's two powerful programs in one, and it's perfect for book reports, term papers or full office use.

Fleet System 2 combines the EASIEST and most POWERFUL word processor available with a lightning-fast 90,000 word spelling dictionary — all in one refreshingly EASY TO USE integrated system. Finally, spell checking is now available at your fingertips.

You can even add over 10,000 "custom" words to the built-in 90,000 word dictionary. And at a suggested retail price of $79.95, Fleet System 2 really spells V-A-L-U-E, and 90,000 other words too!

Fleet System 2 helps people of all ages to learn to *spell correctly* and *write better* too. It's the ONLY full featured word processor that provides you with helpful writing and VOCABULARY FEEDBACK such as: the total number of words in your document, the number of times each word appears, and total number of "unique" words, just to name a few.

Fleet System 2 has every important feature that will help you make child's play out of the most heavy duty typing tasks. There's Built-in 80 Column Display — so what you see is what you get, Horizontal Scrolling During Typing, Easy Correction and Movement of Text, Page Numbering, Centering, Indenting, Headers and Footers, Math Functions, Search and Replace, Mail Merge, BUILT IN 90,000 word SPELL CHECKING and much, much more!

Ask for Fleet System 2. Exceptionally Easy. Packed with Power. Perfectly Priced.

FLEET SYSTEM 2
FLEET SYSTEM 2

UNITED STATES
COMMODORE
USERS GROUP
APPROVED

PSI Call 1-800-343-4074 for the Dealer nearest you!
Professional Software, Inc., 51 Fremont Street, Needham, MA 02194 (617) 444-5224

Fleet System 2™ is a trademark of Professional Software, Inc. — Fleet System 2™ was designed and written by Visiontronics, Ltd. — Commodore 64™ and Commodore 128™ are trademarks of Commodore Electronics Ltd. — Some printers may not support certain Fleet System 2 functions and/or require an interface. Please check with your dealer. — Dealer and Distributor inquiries are invited.

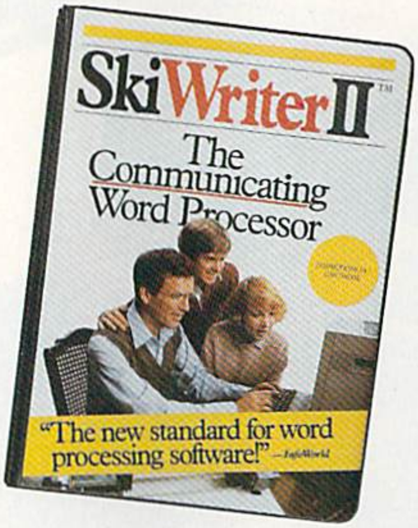
Circle 93 on Reader Service card.

Are you interested in telecommunications, but don't quite know where to begin in setting up your system? This overview of several popular terminal packages will help you decide on the software that's right for you.

VIP
Library

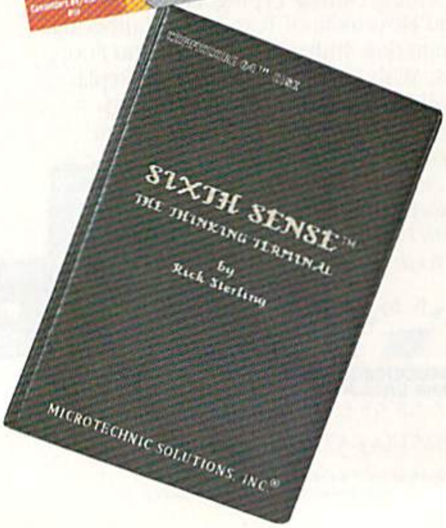
Communications Software: A Vital Link

By JIM GRUBBS


SkiWriter II
The Communicating Word Processor
"The new standard for word processing software!" —InfoWorld

MICROTECHNIC SOLUTIONS
The SMART 64 Terminal
COMMUNICATIONS SERIES
NEW
Commodore 64
Disk

BATTERIES INCLUDED
HomePak
A Breakthrough Integrated Software System
3 in 1
Software System
HomeText
A computerized writing tool
HomeTerm
A telephone communications
HomeFind
An electronic filing system


SIXTH SENSE
THE THINKING TERMINAL
by
Rick Sterling
MICROTECHNIC SOLUTIONS, INC.

Chances are that if you've owned your computer for more than a few weeks, somewhere along the line you have read about or come in contact with the idea of communications by computer. It certainly sounds easy enough. Indeed, there is no reason for telecommunications to be out of anyone's reach.

Often, what should be simple becomes complicated in the real world. That's true of software for computing via telephone line. It's much easier with a friend to guide you along the way.

You need two major additions to your computing setup to enjoy telecommunicating. The first is a piece of hardware called a modem. Previous articles in *RUN* have taken a look at some of the best available, and future reviews will include a look at several new, high-speed modems, such as the 1200-baud 1670 modem from Commodore. The second addition is the terminal software; that is, the program you need for computing by phone line.

Over the months, you've been reading in *RUN* about the many services that are available when you hook up your Commodore 64 or 128 to your phone line. Some of these services, such as PlayNet, come with their own software that is specifically designed to communicate over one particular system. CompuServe even has a special software package, called Vidtex, that is available for C-64 owners. It's a bit different in that it can be used for other telecommunicating as well.

Know What's Available

Selecting a terminal package is not unlike buying a car. Some packages offer only the basics, while others are super-stocked with every option imaginable. Just like cars, software comes in all colors, sizes and price ranges.

"My purchase of RUN *is a better investment than my computer—I get a much higher return on a much smaller investment!"—*

D. Suggs, Tallahassee, Fla.

Join the thousands of C-64, Plus/4, and VIC-20 users around the world who enjoy subscribing to **RUN** every month. They've found **RUN** to be an unrivaled Commodore resource. And they're right—**RUN** is one of the fastest-growing Commodore magazines on earth!

The convenience of personal delivery, plus a savings of **44% off** the newsstand price are yours when you subscribe to **RUN**—the year-round Commodore companion.

You get **12 great issues for just $19.97,** plus special announcements and offers available only to **RUN** subscribers!

Each month, you'll learn the fun of computing while exploring the limitless possibilities of your Commodore.

Here's what satisfied readers are saying:

"I read many magazines after I bought my 64, but I think that yours is the best. I now have a subscription and look forward to every new issue."—Eric D. Stolen, Manistee, MI

"In a remarkably short time, **RUN** has become the best journal for Commodore computer users. . .I appreciate the coverage you devote to reader comments and questions (Magic, Mail RUN, and Commodore Clinic), as there is nearly always an interesting hint or tip in one of these columns!"—J. O'Hare, Victoria, B.C. Canada.

Throughout the year, you'll find:

- Exciting tips, Commodore tricks, and programming ideas in **RUN**'s most popular column, "Magic".
- Challenging, fun, and educational software.
- A rundown of the products best suited for the new C-16 and Plus/4.

The benefits roll on. . . time-saving programming ideas, no-punches-pulled product reviews, applications to broaden your computing horizon, tutorials and assistance from reknowned authors in the Commodore field, and of course, great ideas and tricks that have worked for fellow Commodore users.

Act today—and **save 44%**—joining the thousands of subscribers who've found that **RUN** is their best computing companion. Just send in the coupon or insert card, or call **TOLL-FREE 1-800-258-5473**. In NH, dial 1-924-9471.

Commodore 64, VIC-20 and PLUS/4 are registered trademarks of Commodore Business Machines, Inc.

Software Guide to Word Processing
The Home User's Guide to Commodore Computing
RUN
EXERCISE!
Shape Up with Your C-64
MAKING FACES With Your C-64 & VIC-20
MONITORS or TV? See the Difference

YES! I want to make a great investment.

Send me 12 issues of **RUN** for the low subscription price of $19.97. I'll save 44% off the newsstand price.

☐ Payment enclosed ☐ Bill me

Name ______________________

Address ______________________

City ______________ State ______ Zip ______

Canada & Mexico $22.97; Foreign Surface $39.97, 1 year only, US funds drawn on US bank. Foreign air-mail, please inquire. Please allow 6 to 8 weeks for delivery.

RUN • Box 954 • Farmingdale, NY 11737 35NB3

It's unnecessary for you to learn all about the technicalities of how your computer communicates via modem in order for you to decide on the right terminal package. There are, however, certain pieces of information you do need in order to make your setup work. As long as you stay with the popular on-line services or local bulletin board operations, you shouldn't have too much difficulty. If you are going to try connecting to business computers, you may find setting up your system a bit more difficult.

Why not one standard for all telecommunications? Really, there *are* some standards. However, even subtle variations in transmission can render a circuit uncooperative if you do not match the correct signal.

All of the programs discussed here will accommodate just about all of the common variations that you are likely to encounter in your telecommunicating. They will all operate at standard speeds of 300- and 1200-baud, and they can all be set for proper word length and parity.

For basic telecommunications, any of these packages will work well. On the other hand, if your interest in telecomputing is mainly in accessing the wide variety of software that you can download, then you need to take a special look at what types of downloading are supported by each package. That is an important factor that I'll elaborate on in a moment.

Finally, if you are tying into a system designed to work with professional terminals such as the DEC VT-100, you may need an even more sophisticated software package.

If you already have a modem, it probably came with a terminal program of some kind. Commodore owners originally received VicTerm with the 1600 and 1650 modems. More recently, HiggyTerm has been packaged with the 1660. Incidentally, it's one of the few existing terminal programs for the Plus/4, and it is available for downloading on the Commodore Information Network (on CompuServe). Even though it's for the Plus/4, you can download it using a C-64. Perhaps the best part is that it's free!

VicTerm is a real bare-bones terminal program. With it, you can log on to local bulletin boards and even CompuServe and The Source. However, you can't save messages or send files, nor can you download programs. The program's limitations become obvious pretty quickly.

If you are fortunate enough to have HiggyTerm, you do have quite a few more features available. You can capture information and programs in its buffer, but it lacks true uploading and downloading provisions.

Protocols

If you have a terminal package that has uploading and downloading capabilities, an almost limitless supply of public domain software is available to you. The catch is that there are several systems being used to accomplish such public domain program transfers.

The three most popular systems for the Commodore are Punter, XModem and CompuServe B protocols. A fourth, called ASCII transfer, is also available on most systems. It's not a true transfer system, however, and requires you to do some manipulation in order to send or receive programs.

All three systems have a common goal: the error-free transfer of information from one computer to another.

Just as you sometimes misunderstand something that is said over the phone line because of static or a weak connection, your computer can misunderstand an incoming signal. Even a single error in a 16K program will keep it from working. Transfer protocols were invented to help ensure that if an error occurs, the sending computer retransmits the part of the program that was sent incorrectly.

The granddaddy of such systems is XModem. It has been around for a long time and there's a version of the program for nearly every computer on the market.

The Punter protocol is very similar, though it's designed specifically for Commodore machines. Many Commodore-specific bulletin boards use Punter protocol, largely because Steve Punter also wrote bulletin board software that is still in wide use.

Until quite recently, CompuServe B protocol was available only on CompuServe's Vidtex software package. It has been licensed to others and is now included in several terminal packages. CompuServe also now supports XModem transfer, so the need for special compatible software is not as great as it used to be.

All of these systems ensure the integrity of the data by computing and sending a checksum to the receiving machine. There, it is refigured. If the data is acceptable to the receiving computer, the process is completed. If not, the receiving computer sends a request for retransmission.

ASCII Transfer

Before moving on, let's take a brief look at ASCII transfer.

By using a special utility program, you can take a program file from disk or tape and convert it into a sequential file that contains the standard ASCII codes. (The program is "listed" to disk or tape.) That file can then be sent to another computer in the same way that you would send a regular message, since it is nothing but letters and numbers.

On the receiving end, the file can be captured as a sequential file and then converted, using another utility program.

This system is not without its limitations. For one thing, no error checking is done, so the file may not come through correctly.

Secondly, standard ASCII only recognizes 128 different combinations of characters, while your Commodore computer uses 256 different combinations.

When using a special protocol, such as XModem, everything is sent as a hexadecimal value; thus, the peculiarities of Commodore ASCII are not a factor. Using ASCII transfer, however, some characters will come through in an altered fashion.

If you are just starting out, I would recommend that you use either the terminal package that came with your modem or one of the many available public domain packages to log on to the systems that interest you, and then find out what techniques they use. With that information, you will be in a better position to select a communications package.

Let's jump in and take a look at several of the most popular terminal packages available. Some of the programs have so many features that it's impossible to list them all. Using these reviews as a guideline, you should be able to zero in on several packages to investigate further.

Smart 64 Term/Plus 4

Don't let the name of this one fool you. When I first saw it advertised, I thought I had found a full-featured program for my Plus/4 computer.

Smart 64 Terminal, from Microtechnic Solutions, has been available for some time. The "Plus 4" addition refers to the current enhanced edition of the program that contains some added features.

F-15 STRIKE EAGLE

MAJOR BILL

Hold Onto Your Helmet – This F-15 Is For Real!

"You'll get all the sophistication and thrills of an actual fighter mission. Take it from a jet fighter pilot – this simulation will keep you excited for a long time."

CESSNA and MICRO PROSE
present the
Great American
LEARN TO FLY A REAL AIRPLANE
Contest

$30 OFF COUPON AND FREE FLYING LESSONS!!!

You get a coupon worth up to $30 towards a Cessna "Discovery Flight" in every flying simulation product box — Plus you can win a complete flight training course from Cessna. Details in every box, or see your local dealer.

F-15 COMPARISON

Feature	"Real" F-15	F-15 STRIKE EAGLE	Imitation Game
1. Multiple Weapon Systems			
• Cannon	Yes	Yes	Yes
• MK-82 Bombs	Yes	Yes	No
• Air-Air Missles	Yes	Yes	No
2. Sophisticated Electronics			
• Heads Up Display	Yes	Yes	No
• Radar	Yes	Yes	No
• Electronic Counter Measures	Yes	Yes	No
• Inertial Navigation	Yes	Yes	No
3. Real Combat Missions	Yes	Yes	No
4. Developed and Tested by Real Fighter Pilots	Yes	Yes	No
5. Aerobatic Flying (Loops, Splits, and YoYos)	Yes	Yes	No

F-15 Strike Eagle is available for Commodore 64/128, Apple II and Atari XL/XE computers for a suggested retail of only $34.95. Also for Macintosh and IBM PC/PC Jr., for a suggested retail of $39.95. Call or write for more information or MC/VISA orders.

GREAT REVIEWS!

ANTIC – F-15 STRIKE EAGLE
Launch into the most exciting aerial combat since Star Raiders with the F-15 Strike Eagle... F-15 is an engrossing game which challenges pilots of all skill levels..." Charles Jackson

USA TODAY – F-15 STRIKE EAGLE
"... this is more than the right stuff. Once you've gotten used to flying these banks it will be hard to go back to just cruising from LaGuardia to Logan. F-15 is definitely the only way to fly." Marc Randolph

ANALOG – F-15 STRIKE EAGLE
"...Don't wait. RUN down to you local software merchant and buy a copy of F-15 Strike Eagle today. Tomorrow may be too late!" Patrick J. Kelley

RUN – F-15 STRIKE EAGLE
"...The F-15 Strike Eagle is not an arcade game, but, rather, one of the most realistic combat flight simulators I've ever seen. If you're looking for a chance to experience some high adventure and danger in a realistic and challenging format, F-15 Strike Eagle is for you." Peter Paplaskas

MicroProse Software
F-15
STRIKE
EAGLE

Experience the Reality of These Other Great Simulations from MICROPROSE!

MICRO PROSE
SIMULATION • SOFTWARE

120 Lakefront Drive Hunt Valley, Maryland 21030 301-667-1151

COMMODORE 64, ATARI, APPLE, MACINTOSH, and IBM are registered trademarks of Commodore Business Inc., Atari Inc., Apple Computer Inc., and International Business Machines Inc., respectively. Software Speech by Electronic Speech Systems of Berkeley, Ca.

Daring Attack Helicopter Action in the AH-64 Apache

KENNEDY APPROACH...

Exciting Speech and Graphic Air Traffic Control Action!

You are in Command – D-Day to the Battle of the Bulge!

Circle 157 on Reader Service card.

Major Features of Programs

	Smart 64/ Plus 4	Vidtex	HomePak	Skiwriter II	SuperTerm	Sixth Sense	VIP XL
supports XModem	✓		✓		✓	✓	✓
supports CompuServe B		✓**				✓	no**
supports Punter					✓		
supports ASCII	✓	✓	✓	✓	✓	✓	✓
text editor			✓	✓	✓	✓	✓
VT-100 emulation					✓		
screen size	80*	40	40	40	80	40	40/64/106
split screen			✓			✓	
retail price	$39.95	$39.95	$49.95	$69.95	$89.95	$89.95	$39.95

*Available only through hardware expansion
**Supports CompuServe graphics

This chart highlights some of the major features of these telecommunications packages. All of the programs will work with most popular modems available.

Smart 64 offers a wide range of features. It supports XModem protocol. It also comes with utilities for converting text files into program files. One very nice feature is that Smart 64 supports several popular 80-column cards, such as the Video Pak 80 and XL-80 from Data 20 Corp., and BI-80, from Batteries Included. A wide range of modems are also supported by this software.

If you find you need to communicate with a system that uses ASCII codes in a somewhat different way than most machines, this program offers a special conversion table that can be modified to suit your needs. I should mention again that Commodore ASCII is not standard and must be converted in order to communicate properly with other computers. All terminal programs for the Commodore do this, but few give you the power to customize the translation.

Microtechnic has included help screens that you can call up from within the program. This is a handy feature, particularly when you are first starting out.

Smart 64 does not contain its own text editor. Rather, it is compatible with files created by Easy Script, PaperClip, Wordpro and Script 64. This allows you to create your messages off-line to save connect charges when communicating over one of the pay services.

A 45-page manual is included with Smart 64. Like many programs, I found it took some time for me to learn to operate the program. It did perform well once I got through the learning process. Microtechnic Solutions is unique in that it offers a customer service BBS.

One final note about Smart 64 Terminal/Plus 4: A special version of the program is available that works with the COMvoice speech synthesizer. This should be of special interest to blind computerists. *(Microtechnic Solutions, PO Box 2940, New Haven, CT 06515.)*

Vidtex

Vidtex is the trade name of CompuServe's video text service. Special software for the Commodore 64 is available that takes full advantage of the graphics capabilities of this system.

CompuServe has also developed its own special uploading and downloading system, called B protocol. It is now licensed to other companies, but for a long time, the only way to take advantage of this easy-to-use system was by purchasing Vidtex.

The Vidtex package is a full-featured program that is quite usable on many on-line systems other than CompuServe. The B protocol is the only one supported by Vidtex, though ASCII file transfers can be done using the program's buffer. No text editor is included.

Vidtex is most recommended for two applications. If you plan on taking full advantage of the color graphics that are available in some areas of CompuServe, Vidtex is a must. And, if you like to do a great deal of transferring of files and programs specifically to and from CompuServe, I highly recommend Vidtex. When using it, you don't even have to select what protocol you will need. The CompuServe system queries your machine automatically and prompts you with simple statements to get the job done.

Vidtex is by far the easiest and most accurate way to download and upload when you're using Compu-

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

If you have been looking very long, you have probably discovered that there are just too many claims and counter claims in the printer market today. There are printers that have some of the features you want but do not have others. Some features you probably don't care about, others are vitally important to you. We understand. In fact, not long ago, we were in the same position. Deluged by claims and counter claims. Overburdened by rows and rows of specifications, we decided to separate all the facts — prove or disprove all the claims to our own satisfaction. So we bought printers. We bought samples of all the major brands and tested them.

Our Objective Was Simple

We wanted to find that printer which had all the features you could want and yet be sold directly to you at the lowest price. We didn't want a "close-out special" of an obsolete product that some manufacturer was dumping, so we limited our search to only those new printers that had the latest proven technology. We wanted to give our customers the **best** printer on the market today at a bargain price.

The Results Are In

The search is over. We have reduced the field to a single printer that meets all our goals (and more). The printer is the SP-1000 from Seikosha, a division of Seiko (one of the foremost manufacturers in the world). We ran this printer through our battery of tests and it came out shining. This printer *can* do it all. Standard draft printing at a respectable 100 characters per second, and with a very readable 12 (horizontal) by 9 (vertical) character matrix. This is a full bi-directional, logic seeking, true descender printer.

"NLQ" Mode

One of our highest concerns was about print quality and readability. The SP-1000 has a print mode termed Near Letter Quality printing (NLQ mode). This is where the SP-1000 outshines all the competition. Hands down! The character matrix in NLQ mode is a very dense 24 (horizontal) by 18 (vertical). This equates to 41,472 addressable dots per square inch. Now we're talking ***quality*** printing. It looks like it was done on a typewriter. You can even print graphics using the standard graphics symbols built into your computer. The results are the best we've ever seen. The only other printers currently available having resolution this high go for $500 and more *without* the interface or cable needed to hook up to your computer.

Features That Won't Quit

With the SP-1000 your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in ANY of 35 character styles including 13 double width and 3 reversed (white on black) styles. You not only have the standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Never again will you have to worry about how to print H_2O or X^2. This fantastic machine will do it automatically, through easy commands right from your keyboard. Do you sometimes want to emphasize a word? It's easy, just use **bold** (double strike) or use *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many of these modes and styles to make the variation almost endless. Do you want to express something that you can't do with words? Use graphics with your text — even on the same line. You have variable line spacing of 1 line per inch to infinity (no space at all) and 143 other software selectable settings in between. You can control line spacing on a dot-by-dot basis. If you've ever had a letter or other document that was just a few lines too long to fit a page, you can see how handy this feature is. Simply reduce the line spacing slightly and . . . VOILA! The letter now fits on one page.

NEW
only
$259.95
SEIKOSHA
SP-1000

Forms? Yes! Your Letterhead? Of Course!

Do you print forms? No problem. This unit will do them all. Any form up to 10 inches wide. The tractors are adjustable from 4 to 10 inches. Yes, you can also use single sheets. Plain typing paper, your letterhead, short memo forms, labels, anything you choose. Any size to 10" in width. In fact this unit is so advanced, it will load your paper automatically. Multiple copies? Absolutely! Use forms (up to 3 thick). Do you want to use spread sheets with many columns? Of course! Just go to condensed mode printing and print a full 136 columns wide. Forget expensive wide-carriage printers and changing to wide carriage paper. You can now do it all on a standard 8½" wide page, and you can do it quietly. The SP-1000 is rated at only 55 dB. This is quieter than any other impact dot matrix printer that we know of and is quieter than the average office background noise level.

Consistent Print Quality

Most printers have a ribbon cartridge or a single spool ribbon which gives nice dark printing when new, but quickly starts to fade. To keep the printers output looking consistently dark, the ribbons must be changed quite often. The SP-1000 solves this problem by using a wide (½") ribbon cartridge that will print thousands of pages before needing replacement. (When you finally do wear out your ribbon, replacement cost is only $11.00. Order *#2001.)*

The Best Part

When shopping for a printer with this quality and these features, you could expect to pay around $500 or more. *Not now!* We sell this fantastic printer for **only $259.95! You need absolutely nothing else to start printing — just add paper.**

No Risk Offer

We give you a 2-week satisfaction guarantee. If you are not completely satisfied for any reason we will promptly refund your purchase. A 1-year warranty is included with your printer. The warranty repair policy is to repair or replace and reship to the buyer within 72 hours of receipt.

The Bottom Line

Be sure to specify the order # for the correct version printer designed for your computer.

Commodore C-64 & C-128, Order #2200, cable included

IBM-PC and compatibles, Order #2100, plus 8' cable #1103, $26.00

Standard Parallel with 36 pin Centronics connector, Order #2400, no cable

We also have interfaces and cables for other computers not listed. Call Customer Service at 805/987-2454 for details.

Shipping and insurance is $10.00 — UPS within the continental USA. If you are in a hurry, UPS Blue (second day air), APO or FPO is $22.00. Canada, Alaska, Mexico are $30.00 (air). Other foreign is $70.00 (air). California residents add 6% tax. The above are cash prices — VISA and MC add 3% to total. We ship the next business day on money orders, cashiers' checks, and charge cards. A 14-day clearing period is required for checks.

For information call 805/987-2454

TO ORDER CALL TOLL FREE
1-(800) 962-5800 USA
1-(800) 962-3800 CALIF. (8-6 PST)

or send order to:

APROTEK
1071-A Avenida Acaso
Camarillo, CA 93010

Serve. *(CompuServe, 500 Arlington Centre Blvd., Columbus, OH 43220.)*

HomePak

To switch gears for a moment, I'd like to discuss two communications programs that come as part of an integrated software package.

HomePak contains a surprisingly versatile terminal program, called HomeTerm. The package also includes a word processing program and a simple database manager. As you would expect, text files created using the word processor can be transmitted directly with the communications software. With the word processor, you can easily edit files that you have captured over the telephone line.

Perhaps the most pleasant surprise you'll find in HomeTerm is that XModem protocol is supported by this package. That makes program transfer a breeze, even on CompuServe. This package also includes a Vidtex option that eliminates the strange codes you sometimes see if you are not using Vidtex when logging on to CompuServe.

Another of my favorite features is the Buffered Send option, which allows you to type in a maximum of 80 characters without sending them. If you are a ten-thumbs typist, this can be a real advantage. It is also a great feature when you're using the CB simulator, allowing you to compose your message in a separate part of the screen.

HomeTerm's receiving buffer is only about 11K bytes, which is a bit small compared to some. I did find the character set a bit difficult to read on my screen, but, all in all, was very impressed with the clearness of the program's instructions and ease of operation. *(Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5.)*

Skiwriter II

Another integrated package is Skiwriter II. Skiwriter comes in cartridge format. It may only have been my unit, but I found it difficult to determine which side of the cartridge was supposed to face up, due to the way it's labeled. Without forcing it, the cartridge will go in only one way, so that was just a minor problem.

I found the word processing portion of Skiwriter to be more than adequate. The instruction manual is clear and concise—a pleasure to read. With the program on cartridge, switching from word processing to telecommunications is instantaneous.

Unfortunately, Skiwriter supports only ASCII file transfer. That works fine for transmitting text, but not very well for programs.

If you find cartridges more convenient and you intend to use the telephone connection mainly for sending text files, Skiwriter should work well for you. *(Prentice-Hall Home Software, PO Box 819, Englewood Cliffs, NJ 07632.)*

SuperTerm

Midwest Micro was one of the early pioneers in providing communications software for Commodore machines. Many of us started with the Terminal 40 for the VIC-20, which allowed for a 40-column screen created by software.

Several years ago, I needed to be able to communicate with a minicomputer at work that was designed to talk to VT-100 terminals. The SuperTerm package claimed to emulate this rather expensive industry-standard terminal.

Being one of the original users of SuperTerm, I had the privilege of paying full price for it. At $150, it wasn't exactly small change.

The package had a lengthy instruction manual that was very well written. However, due to the complexity of the program, I still had to spend almost two full evenings learning how to work with it.

The SuperTerm package lived up to its promise to emulate the VT-100. The program offers a pseudo 80-column screen that, while still only displaying 40 columns at one time, allows you to scroll from side to side to allow for a full 80 columns. It's a compromise, but it works.

SuperTerm includes a text editor that has enough features to tempt you to use it to write an occasional letter. The program also allows for user-defined ASCII codes, making it adaptable to virtually any environment.

The version of SuperTerm that I have supports Punter protocol and ASCII transfer. It can accommodate neither XModem nor special CompuServe abilities. Newer versions of the program offer XModem and a special SuperTerm proprietary protocol.

The cost for SuperTerm has dropped considerably since the release of the original version, making it a better value for your money. Especially if you are looking for the VT-100 (or VT-52/62/102) emulation capabilities, you may want to consider this program. *(Midwest Micro, PO Box 6148, Kansas City, MO 64110.)*

Sixth Sense

Not satisfied with the versatility of Smart 64, Microtechnic Solutions went back to the drawing board to create a "super" terminal package. Sixth Sense includes all of the features of its older brother, plus a lot more.

Under license from CompuServe, Sixth Sense now includes B protocol; the program also continues to support XModem. A split-screen option (similar to a buffered send) is also included.

A 700-line virtual screen allows you to glance backwards at something that has just scrolled off the screen, without having to leave the main terminal program.

I found the 100-page instruction manual somewhat easier to read than the one included with Smart 64. A few more specific examples might have been helpful, but, all in all, I was able to operate the program almost immediately.

Another added feature is a built-in screen editor that allows you to compose messages and edit received text. A full complement of features is also included, making Sixth Sense one of the most versatile programs available. *(Microtechnic Solutions, PO Box 2940, New Haven, CT 06515.)*

VIP Terminal XL

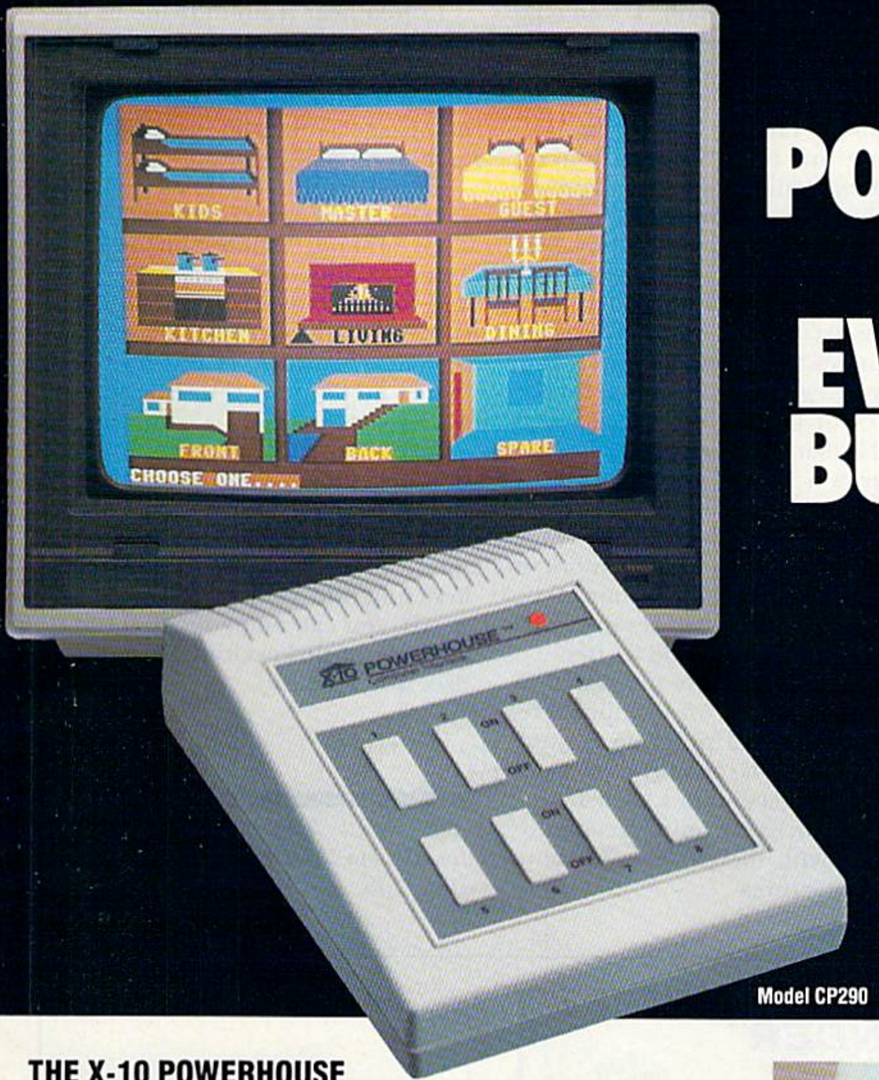
There's a reason that the star performer always appears last. So it is with VIP Terminal XL, which is the latest version of the program. VIP is like nothing else we've looked at so far.

From the time VIP begins loading, you know something special is about to happen. What you find after the program loads is a piece of software that is designed to make telecommunications as simple as possible.

Perhaps one of the most obvious advantages of VIP Terminal XL is that it supports 40-, 64- and 106-column screens, without requiring additional hardware support. The display may be a bit fuzzy on the Commodore color monitor, but it is still quite readable. A choice of several character styles will also help you overcome the problem.

While it's not VT-52-compatible in the absolute sense, VIP does share some of the control codes with the VT-52, and these codes are well documented. While B protocol is not supported, color graphics are. XModem

THE X-10 POWERHOUSE DOES EVERYTHING BUT PUT OUT THE CAT.



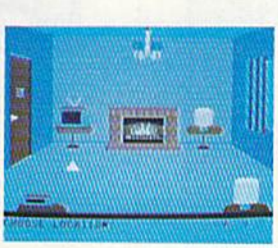
Model CP290

THE X-10 POWERHOUSE INTERFACES WITH YOUR COMMODORE TO CONTROL YOUR HOME...FOR SECURITY, COMFORT AND ENERGY SAVINGS.

This remarkable Interface lets you run your home through your Commodore 64 or 128 and a keyboard or joystick.

When you're away, it makes your home look and sound lived in. When you're home, it can turn off the TV at night and wake you up to stereo and fresh brewed coffee in the morning. It can even turn on your air conditioner and control your heating.

SPECIAL COLOR GRAPHICS MAKE PROGRAMMING A SNAP. You simply pick a room from the display screen. Use your keyboard or joystick to position graphics of lights or appliances. Then follow on-screen instructions to program any light or appliance to go on or off whenever you choose. You can even control thermostats, light intensity and more.



THE WAY IT WORKS. The X-10 Powerhouse Interface is cable-connected to the Commodore "User" port and plugged into a standard 110V outlet. After it is programmed, the Interface sends digitally encoded signals through your home wiring to special X-10 Modules. To control a lamp or appliance, you simply plug the electrical device into a Module and then plug the Module into an outlet. The Interface can control up to 256 Modules throughout your home and won't interfere with normal use of lights and appliances.

There are plug-in Appliance Modules, Lamp Modules, Wall Switch Replacement Modules and Special 220V Modules for heavy duty appliances such as water heaters and room air conditioners. Plus Thermostat Controllers for central heating and air conditioning, Telephone Responders to control your home from any phone, and much more.

IT WON'T TIE UP YOUR COMPUTER. Use your computer only for programming. When you're finished, disconnect the Interface from the "User" port and keep it plugged into any convenient power outlet in your home. It will operate as a stand-alone controller with battery back-up and will run your home automatically.

SURPRISINGLY INEXPENSIVE. A Powerhouse System including the Interface, software and connecting cables costs less than $150. X-10 Modules are less than $20 each.

FOR THE X-10 POWERHOUSE DEALER NEAREST YOU, CALL TOLL-FREE: 1-800 526-0027
NEW JERSEY RESIDENTS CALL (201) 784-9700

X-10® POWERHOUSE
NUMBER ONE IN HOME CONTROL

Commodore 64 and Commodore 128 are registered trademarks of Commodore Int'l Ltd.

Circle 77 on Reader Service card.

allows efficient uploading and downloading. (Punter protocol is also supported in the *old* version.)

The manual is 112 pages, written in the clearest and most concise manner of any of the packages examined here. You really have to see VIP to appreciate it.

Really, it's not so much that VIP Terminal XL offers features not available in other packages, it's more the way in which they are implemented that makes the program special. VIP is deserving of its name, and if you plan on doing a lot of telecommunicating, it deserves your serious consideration. *(Softlaw, 9072 Lyndale Ave. South, Minneapolis, MN 55420.)*

Budget Bonanza

Perhaps you want to take advantage of all of the excitement of telecommunications, but are really on a tight budget. There's no reason for you not to become involved, as there are numerous public domain telecommunications programs available for you to use.

I've already mentioned HiggyTerm. Since many of you received that with your modem, I won't go into detail about it here. It is available on the Commodore Information Network (on CompuServe) for both the C-64 and C-128.

There are numerous versions of XModem available for the Commodore machines. A popular public domain version was translated by Karl Schmitt. It's available through many user's groups. Karl's original program is written in Basic and offers only somewhat limited features. It is, however, a good, solid system for the transfer of programs. I often use it for XModem transfers.

There's a deluxe version of XModem that improves almost daily. Once again, you can find it either on the Commodore Information Network or through many local user's groups. It includes many of the features discussed in the programs here, and it's free!

If you are especially interested in the CB simulation on CompuServe, a special terminal program is available that includes a split-screen display and an 80-column screen. It, too, is improved upon quite frequently, so check with the CB people about its latest features.

I often hear from individuals who are not near a local user's group or are unable to travel to meetings. There is an organization that brings many aspects of the local user's group to you, no matter where you live.

The Toronto Pet Users' Group (TPUG) is one of the oldest and largest clubs around. Membership includes access to the group's enormous disk and tape library at a very reasonable copying charge. They have numerous telecommunications programs, so there's no need for you to be without access to software.

Telecommunications is a wonderful thing. It provides the opportunity for people from all around the world to get together and share a common interest. By selecting the software best suited to your communications needs, you can enjoy just as little or as much of this exciting field as you like. Bon appetit! R

Address all author correspondence to Jim Grubbs, PO Box 3042, Springfield, IL 62708.

Circle 120 on Reader Service card.

DISK COMMANDER™

FULLY AUTOMATIC

VERS 2.0
Super Disk Copier System
* 3 MIN. COPIER

FOR C64/C128 AND 1541 DRIVE

* BAM COPIER
* NIBBLE COPIER

Copy Tracks/Half Tracks Up To Track 40. Sync Tracks, Gap Tracks, Bad Headers, Errors (20,21,22,23,27,29). Hidden IDs, Extra Sectors, Non Standard Formats, DOS Information. No Drive Rattle On Copy. Super Fast Copies Of Your Software From Your 1541.

ABSOLUTELY INCREDIBLE! $45.95 SYSTEM

SUPER POWERS #1
Professional BASIC Utilities
AUTOLOAD (Load programs w/single key)
AUTOBOOT (Make programs self-RUN)
AUTOLIST (Printer listings made easy)
RENUM (Fast program re-numbering)
DENEW (Recover BASIC program)
DODAT (Data Statements from ML)
APPENDER (Chain BASIC programs)
SCREEN DUMP
FILE COPY
PROTECTOR (Scratchproof files, disks)

YOU'LL LOVE IT!
$24.95

SUPER POWERS #2
Professional 1541 Utilities
SPEED FORMAT
Format full/half tracks up to track 40.
Partial/full disk, single track format.
Writes proper blocks w/BAM & Directory.
Format multiple disks simultaneously.
9 Sec./18 Secs. with verify.
DISKMON
Read/Write tracks, sectors, headers to track 40.
Create your own Headers and Hidden IDs.
Edit ML programs right on disk.
DRIVEMON
Read/Write 1541 memory in HEX or Decimal.
Display output to Screen or Printer.

YOU NEED THIS! $29.95

TO ORDER CALL 1-800-237-8400 EXT. 200 24 HRS./7 DAYS
FLORIDA 1-800-282-1469 EXT. 200
TECHNICAL LINE 1-813-792-5300

MasterCard VISA

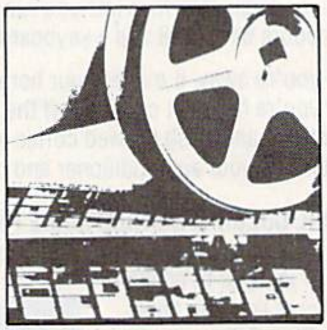
PAYMENT/SHIPPING

	MC VISA	Pers. Check	Cert. Check Drawn on US Bank	Money Order US Dollars	COD [illegible]	Shipping & Handling Add
USA (all states)	YES	YES	YES	YES	[illegible]	[illegible]
AK HI APO FPO	YES	NO	YES	YES	NO	[illegible]
Canada/Mexico	YES	NO	YES	YES	NO	[illegible]
Foreign	YES	NO	YES	NO	NO	[illegible]

[illegible]
MasterCard/Visa orders require Card No. Exp. Date

POWERSOFT
INCORPORATED
P.O. BOX 7333 BRADENTON, FL 33507

This Publication is available in Microform.



University Microfilms International

Please send additional information
for ____________
Name ____________
Institution ____________
Street ____________
City ____________
State ______ Zip ______

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

FEEL WHAT IT'S LIKE TO BE IN THE FIELD OF FIRE.

When you play FIELD OF FIRE™, you'll lead one of the finest fighting forces of World War II — Easy Company of the First Infantry Division — into eight historical battles.

Dividing your company into fireteam units of six men, you'll engage in such exciting combat as a night raid in North Africa, the storming of Omaha Beach on D-Day, or a defensive delaying action in the Battle of the Bulge — all against German forces controlled by your cunning computer.

Special attention has been paid to the Hi-Res graphics and lively sound effects. Realistic rules cover every aspect of the fighting: Line-of-sight, hidden movement, weapons ratings. Even your soldiers' abilities will improve through time.

To experience the heart-pounding thrill of commanding these heroic men, run to your nearest game or computer/software store today!

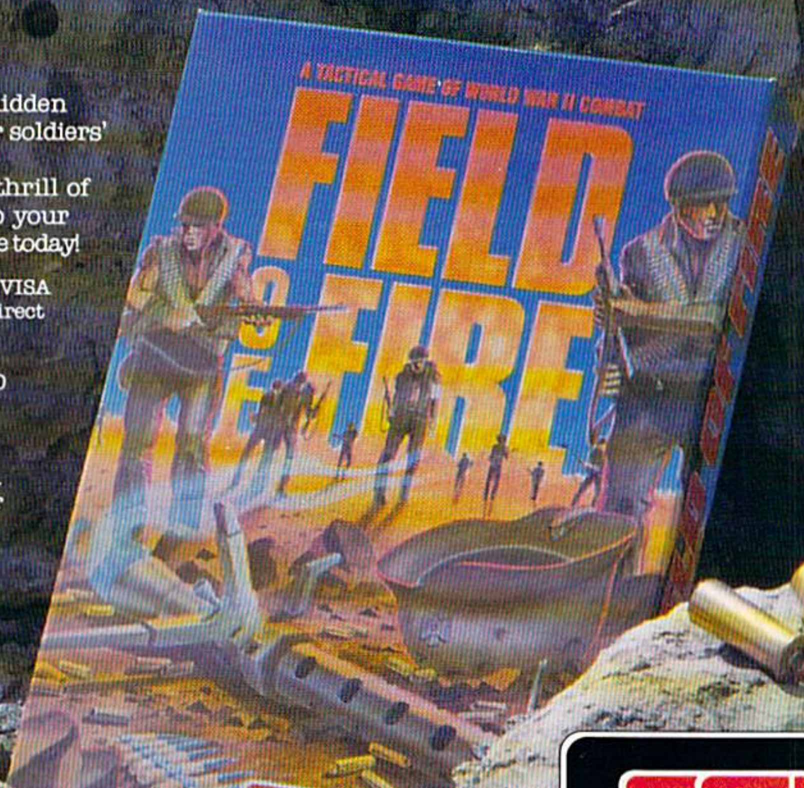
If there are no convenient stores near you, VISA and M/C holders can order this $39.95 game direct by calling 800-227-1617, ext. 335 (toll free). In California, call 800-772-3545, ext. 335. Please specify computer format and add $2.00 for shipping and handling.

To order by mail, send your check to: STRATEGIC SIMULATIONS, INC., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (California residents, add 7% sales tax.) All our games carry a "14-day satisfaction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES.

Circle 25 on Reader Service card.

On diskette for COMMODORE 64™ and 48K ATARI® home computers. APPLE® version coming in fall '85.



STRATEGIC SIMULATIONS, INC.

© 1985 by Strategic Simulations, Inc.

COMMODORE 64, ATARI, and APPLE are trademarks of Commodore Electronics, Ltd., Atari, Inc., and Apple Computer, Inc., respectively.

SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPUSERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to your life.

It turns that marvel of the 20th century, the personal computer, into something useful.

Unlike most personal computer products you read about, CompuServe is an information service. It isn't software. It isn't hardware. And you don't even have to know a thing about programming to use it. You subscribe to CompuServe—and 24 hours a day, 7 days a week, it puts a universe of information, entertainment and communications right at your fingertips.

A few of the hundreds of things you can do with CompuServe.

COMMUNICATE

EasyPlex™ Electronic Mail lets even beginners compose, edit, send and file messages the first time they get online. It puts friends, relatives and business associates—anywhere in the country—in constant, convenient touch.

CB Simulator features 72 channels for "talking" with thousands of other enthusiastic subscribers throughout the country and Canada. The chatter is frequently hilarious, the "handles" unforgettable, and the friendships hard and fast.

More than 100 Forums welcome your participation in "discussions" on all sorts of topics. There are Forums for computer owners, gourmet cooks, veterinarians, pilots, golfers, musicians, you name it! Also, Electronic Conferencing lets businesses put heads together without anyone having to leave the shop.

Bulletin Boards let you "post" messages where thousands will see them. You can use our National Bulletin Board or the specialized Bulletin Boards found in just about every Forum.

HAVE FUN

Our full range of games includes "You Guessed It!", the first online TV-style game show you play for real prizes; and MegaWars III, offering the ultimate in interactive excitement. And there are board, parlor, sports and educational games to play alone or against other subscribers throughout the country.

Movie Reviews keep that big night at the movies from being a five star mistake.

SHOP

THE ELECTRONIC MALL™ gives you convenient, 24-hour-a-day, 7-day-a-week shopping for name brand goods and services at discount prices from nationally known stores and businesses.

SAVE ON TRIPS

Travelshopper℠ lets you scan flight availabilities (on virtually any airline—worldwide), find airfare bargains and order tickets right on your computer.

Worldwide Exchange sets you up with the perfect yacht, condo, villa, or whatever it takes to make your next vacation *a vacation*.

A to Z Travel/News Service provides the latest travel news plus complete information on over 20,000 hotels worldwide.

MAKE PHI BETA KAPPA

Grolier's Academic American Encyclopedia's Electronic Edition delivers a complete set of encyclopedias right to your living room just in time for today's homework. It's continuously updated … and doesn't take an inch of extra shelf space.

The College Board, operated by the College Entrance Examination Board, gives tips on preparing for the SAT, choosing a college and getting financial aid.

KEEP HEALTHY

Healthnet will never replace a real, live doctor—but it is an excellent and readily available source of health and medical information for the public.

Human Sexuality gives the civilization that put a man on the moon an intelligent alternative to the daily "Advice to the Lovelorn" columns. Hundreds turn to it for real answers.

BE INFORMED

All the latest news is at your fingertips. Sources include the AP news wire (covering all 50 states plus national news), the Washington Post, USA TODAY Update, specialized business and trade publications and more. You can find out instantly what Congress did yesterday; who finally won the game; and what's happening back in Oskaloosa with the touch of a button. And our electronic clipping service lets you tell us what to watch for. We'll electronically find, clip and file news for you…to read whenever you'd like.

INVEST WISELY

Comprehensive investment help just might tell you more about the stock you're looking at than the company's Chairman of the Board knows. (Don't know who he is? Chances are, we can fill you in on that, too.) CompuServe gives you complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 50,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And more than a dozen other investment tools.

Site II facilitates business decisions by providing you with demographic and sales potential information by state, county and zip code for the entire country.

National and Canadian business wires provide continuously updated news and press releases on hundreds of companies worldwide.

GET SPECIALIZED INFORMATION

Pilots get personalized flight plans, weather briefings, weather and radar maps, newsletters, etc.

Entrepreneurs use CompuServe too for complete step-by-step guidelines on how to incorporate the IBMs of tomorrow.

Lawyers, doctors, engineers, military veterans and businessmen of all types use similar specialized CompuServe resources pertinent to their unique needs.

And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. With CompuServe, you get low start-up costs, low usage charges and local phone-call access in most major metropolitan areas.

Here's exactly how to use CompuServe.

First, relax.

There are no advanced computer skills required.

In fact, if you know how to buy breakfast, you already have the know-how you'll need to access any subject in our system. That's because it's "menu-driven," so beginners can simply read the menus (lists of options) that appear on their screens and then type in their selections.

Experts can skip the menus and just type in "GO" followed by the abbreviation for whatever topic they're after.

In case you ever get lost or confused, just type in "H" for help, and we'll immediately cut in with instructions that should save the day.

Besides, you can either ask questions online through our Feedback service or phone our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit, a computer, a modem to connect your computer to your phone, and in some cases, easy-to-use communications software. (Check the information that comes with your modem.)

With your Subscription Kit, you'll receive:

- a $25 usage credit.
- a complete hardcover Users Guide.
- your own exclusive user ID number and preliminary password.
- a subscription to CompuServe's monthly magazine, *Online Today.*

Call **800-848-8199** (in Ohio, 614-457-0802) to order your Subscription Kit or to receive more information. Or mail this coupon.

Kits are also available in computer stores, electronic equipment outlets and household catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.

☐ Please send me additional information.
☐ Please send me a CompuServe Subscription Kit.
☐ I am enclosing my check for $39.95, plus $2.50 handling. *(Add sales tax if delivered in Ohio.)*
Please make check payable to CompuServe Information Services, Inc.
☐ Charge this to my VISA/MasterCard
#__________
Expiration Date __________
Signature __________
Name __________
Address __________
City __________
State __________ Zip __________

MAIL TO:

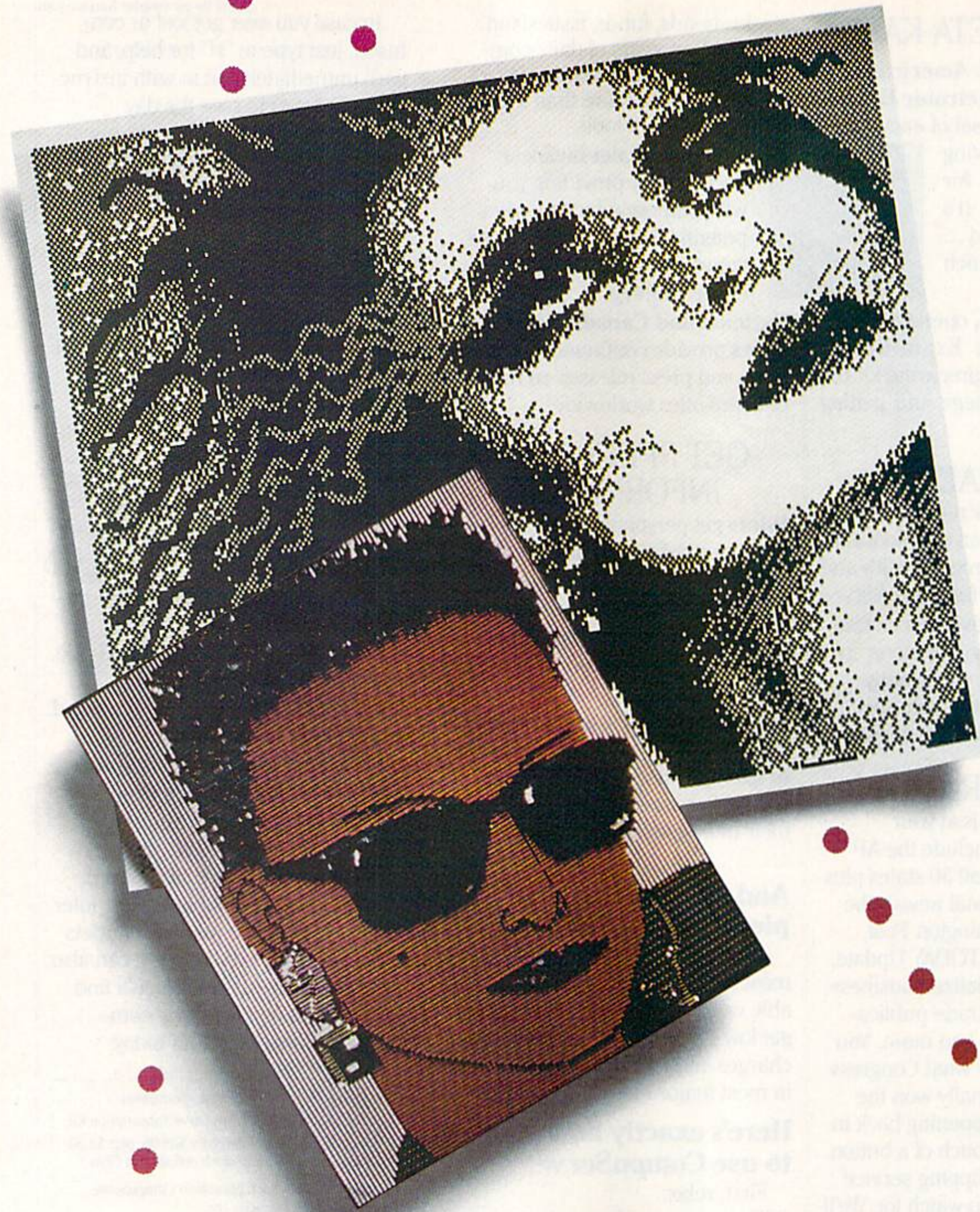
CompuServe®

Customer Service Ordering Dept.
P.O. Box L-477
Columbus, Ohio 43260

PRI-2011

An H&R Block Company

EasyPlex and ELECTRONIC MALL are trademarks of CompuServe, Incorporated. Travelshopper is a service mark of TWA.



By ROBIN FRANZEL

Now, with only one program, you can print both low- and high-resolution screens. And doing so is as simple as pressing a function key.

Print Screen Plus

If you've ever worked with either high- or low-resolution graphics, you've probably wished that you had some way to capture that screen image on paper. After all, even the Commodore 1525 printer is capable of producing bit-mapped graphics of surprisingly good quality.

The accompanying program, Print Screen Plus (Listing 1), will dump a text screen to any printer and a high- or low-resolution graphics screen to your dot-matrix printer. You only have to press a function key, and the program will determine whether you're in high or low resolution and print accordingly.

It will also load a previously saved hi-res screen, whether that screen was saved as a sequential file, a straight program file or a Koala file. You needn't concern yourself with what type of file you're loading. Just enter the filename, and the Print Screen Plus program will figure out what you're talking about and load it.

You can also save a hi-res screen to disk by just pressing a function key and entering the filename.

If you're in lo-res and have a hi-res screen loaded, you can view your hi-res screen by pressing another key. While in the view screen, f1 will print the hi-res screen, and the space bar will return you to your prior screen.

Printing Your Screen

To use Print Screen Plus, type in and save Listing 1, then run it. If you have a 1525 printer, you're all set to use the program as described below. The new interrupt routine will now be enabled.

If you have a non-Commodore printer, then, after you have typed in and run Listing 1 (this will enable the new interrupt routine), type in and run Listing 2. This program will modify the main program to work with a Gemini 10X printer with a Cardco ?/+G interface. It is easily modifiable to work with virtually any dot-matrix printer and will enable you to take full advantage of your non-Commodore printer's capabilities.

Listing 3 is provided for your convenience. It will save the machine language program to disk with the name HIRESUTIL, which will enable you to start up the program by entering:

```
LOAD "HIRESUTIL",8,1
```

and then

```
SYS49152
```

This will load the program much faster and, for non-Commodore printer users, will make it unnecessary to load and run two programs.

To use the program, load and run Listing 1 and, if necessary, Listing 2. Make modifications to the program, if desired, as described below, and then load and run Listing 3. You'll be asked to insert a disk and press a key when ready. When you press a key, the Print Screen Plus program will be saved on your disk.

Listings 1 and 2 are provided with a checksum routine. The last number on each line is the sum of the other numbers on the line. If you make a typing error while entering the programs, you will be told in which line you made an error. Check that line carefully. If it looks okay, then you have probably entered an extra number or comma on the end of the previous line.

RUN It Right

C-64; C-128 (in C-64 mode)
Disk drive; printer

How It Works

The program is interrupt-driven, which means that it can work even while you have another program running (as long as there isn't a conflict for memory use). Sixty times a second, location 197 ($C5) in the C-64 is checked for a depressed key. If one of the function keys is pressed, then the Print Screen Plus program takes over and does its work. When it is finished, it returns you to where you left off in your program. You can change the keys that do the work, but the program defaults are as follows:

- f1 Checks to see if you are in High-Resolution or Low-Resolution mode and prints the screen.
- f3 Prompts you for a hi-res filename and then loads a file. Pressing the return key without a filename will return you to your processing.
- f5 Prompts you for a filename, and then saves the hi-res screen. Pressing the return key without a filename will return you to your processing.
- f7 Turns on Hi-Res mode for viewing a screen in memory. Press the f1

Screen Locations

X→	0------7	8------15	....	312------319
Y ↓				
0	Byte 0	Byte 8		Byte 312
1	Byte 1	Byte 9		Byte 313
:				
:				
7	Byte 7	Byte 15		Byte 319
8	Byte 320	Byte 328		
9	Byte 321	Byte 329		
:				
:				
15	Byte 327			
16				
:				
:				
199				

Table 1. *Bit-map layout.*

key to print the screen or the space bar to return to your processing.

To change the keys that perform these functions, simply update a four-character table in the program with the key code for the new key. A chart of these key codes can be found in *RUN*'s Special Issue on p. 146. To disable a function, Poke the table with a 0. The program table is in location 49283 ($C083) and is in Print, Load, Save and View sequence.

For example, to change the program so that the £ key initiates the save function, enter:

```
POKE 49285,48
```

Location 49300 ($C094) contains the secondary address when opening the printer. You need to Poke this location if you want to change from uppercase/graphics to lowercase/business mode when printing a low-resolution screen. The default is uppercase. To change to lowercase, enter:

```
POKE 49300,7
```

To change back to uppercase, enter:

```
POKE 49300,0
```

It's very easy to use the Print Screen Plus program from Basic in Direct mode or from your Basic program. A jump table has been provided for easy access to the main routines. Just type SYS, followed by the memory location specified in the first column below, and the function to the right will be activated.

49152 ($C000)	Turns on the interrupt routine
49155 ($C003)	Turns off the interrupt routine
49158 ($C006)	Prints lo- or hi-res screen (whichever is on screen)
49161 ($C009)	Prints lo-res screen
49164 ($C00C)	Prints hi-res screen
49167 ($C00F)	Loads file
49170 ($C012)	Saves file
49173 ($C015)	Turns on Bit-mapped mode
49176 ($C018)	Turns off Bit-mapped mode

Why do you need to use Listing 2 for non-Commodore printers? One reason is speed. With only Listing 1, dumping a hi-res screen to the Commodore 1525 printer takes a respectable four minutes and 12 seconds.

With Listing 2, my Gemini printer will print a hi-res screen in 35 seconds! The program routine provided by Listing 2 enables you to bypass the interface and send control and data codes directly to the printer. The control codes are sent to the printer at the beginning of every hi-res line. The codes provided with the program are as follows:

```
CHR$(27)CHR$(64)
```

to initialize the printer;

```
CHR$(27)CHR$(51)CHR$(16)
```

for nine lines/inch; and

```
CHR$(27)CHR$(75)CHR$(64)CHR$(1)
```

to set to Bit-mapped mode, 320 bits per line.

The first two CHR$ codes are unnecessary, but I wanted to allow for as many codes as you might need for any printer. To make it work with your printer, check your printer's manual to see what codes put you in Graphics mode. Then, starting at location 50867 ($C6B3), Poke those codes into the program. Next, Poke the number of codes you entered into location 49595 ($C1BB), so that the program knows where to start putting the hi-res data. If you update and save the program with Listing 3, you won't have to Poke in those codes every time you use the program.

High Resolution vs. Low Resolution

There are two kinds of high-resolution screens on the C-64: Bit-mapped mode and Multicolor Bit-mapped mode. Print Screen Plus will print either mode, but occasionally your multicolor graphics screen won't look exactly the same as when it was created. (To see exactly what your printout will look like, press f7, the View option.) To understand why this is so, let's take a look at how high resolution is accomplished.

Here is the reason your screen display will differ from your printout. In Low-resolution mode, characters are Poked into an area of memory called the screen map (this is usually in location 1024 or $0400) by a one-byte code. Even though characters appear on the screen as a group of little dots, or pixels (in fact, each character occupies a cell eight pixels high and eight pixels wide), it only takes one byte to identify it. Therefore, since there are 40 columns and 25 lines on the screen, the lo-res screen map only has to be 1000 bytes (40 × 25).

Bit-mapped graphics requires a new screen map that is 8000 bytes long. Each character location, or cell, is made up of eight bytes, and each bit in the map corresponds to a single pixel on the screen. Hence, the term "bit-mapped."

See Table 1 for a layout of the bit map.

Some examples should make this layout easy to follow. If X (0–319) represents the horizontal pixels and Y (0–199) represents the vertical pixels, a pixel is referenced by its (X,Y) coordinates. To turn on pixel (4,5), the fifth bit in the sixth byte should be set to 1. To turn on pixel (7,7), the last bit in byte 7 should be set to 1. However, to turn on the bit just to the right of it (8,7), the first bit in byte 15 should be set to 1.

Bit-map cells control the color. Print Screen Plus recognizes only color 0 (white) and color 1 (dark gray). If a bit within a cell is turned off (0), the computer recognizes that color to be white. If the color is set to 1, it is recognized as dark gray.

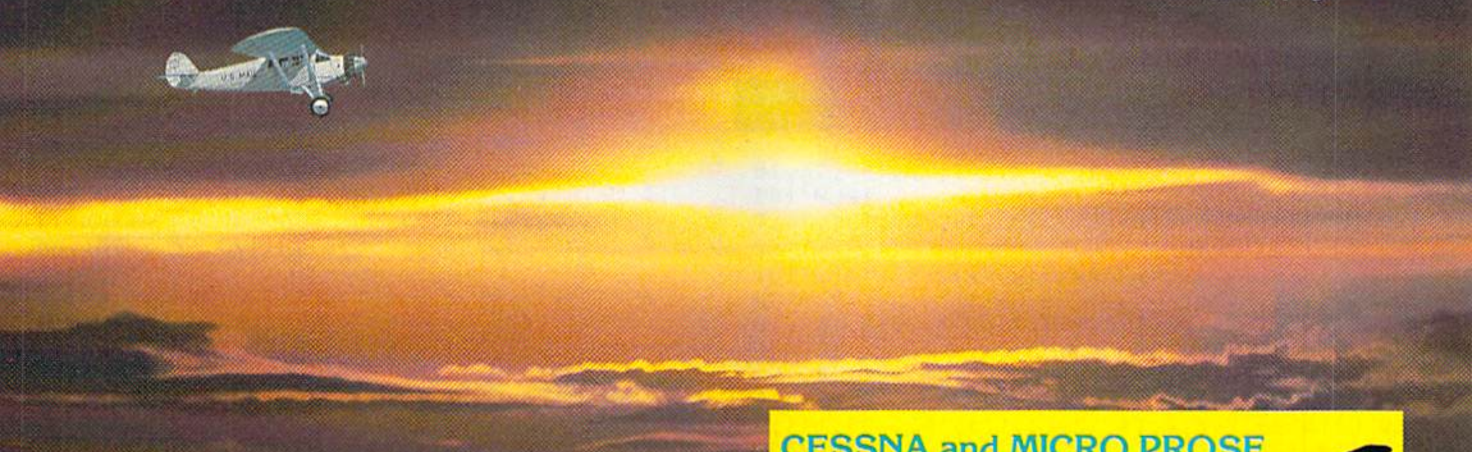
Four colors are available in Multicolor Bit-mapped mode. Two bits are required to select one color. In

Circle 68 on Reader Service card.

SOLO FLIGHT

"The only Flight Simulator that gives you the real feel and thrill of Primary Flight Training with the FUN, Ease of Use and challenge even for the best fighter pilot!"

Major Bill
3,000 Flying Hours



NOW INCLUDES:

MAIL PILOT MISSION

Brave the wind, weather, and mechanical failures in an exciting and increasingly challenging race to deliver the mail to 21 different airports from Kansas to Colorado!

INSTRUCTOR PILOT OPTION

On screen guidance from a real instructor pilot to help you make your first Solo!

CESSNA and MICRO PROSE

present the

Great American

LEARN TO FLY A REAL AIRPLANE

Contest

$30 OFF COUPON AND FREE FLYING LESSONS!!!

You get a coupon worth up to $30 towards a Cessna "Discovery Flight" in every flying simulation product box — Plus you can win a complete flight training course from Cessna. Details in every box, or see your local dealer.

Truly Unique Flying Experience –

olo Flight is an exciting and sophisticated rimary Flight Training Simulator that makes arning to fly Fun and Easy! Designed by a eal fighter pilot, who taught more than 200 ir Force Lieutenants how to fly, Solo Flight kes you from your first taxi to take-off; rough your first solo; and all the way up to e challenge of the Mail Pilot Mission!

olo Flight features full instrumentation, ultiple air navigation maps, emergency rocedure practice, the unique "in-the-slot" 3-imensional flight perspective, and fun and hallenge for pilots of all ages!

USA TODAY – SOLO FLIGHT

"... there's a revised pecking order in the air... easier to master (than another famous flight simulator) (Solo Flight) ... loses none of the subtlety of flight, even when you've logged dozens of hours."
Marc Randolph

CREATIVE COMPUTING – SOLO FLIGHT

"... is a flight simulator designed with fun in mind... it's easier to fly than Sublogic's Flight Simulator and...it is more fun to play." John Anderson

COMPUTE!'s GAZETTE – SOLO FLIGHT

"... The word that best describes Solo Flight is Fun... it's (for those who) don't wish to spend a lot of time reading, but would rather be flying."
David Florance

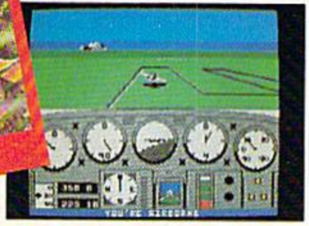
MicroProse Software
Solo Flight
As Close to the Real Thrill of Flying as You Can Handle!!!

NEW & IMPROVED!

For Commodore, Atari & IBM

Introducing:

- New & Improved Cockpit
- New Navigation Maps
- Software Speech (C-64 only)



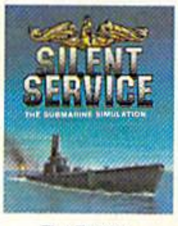
olo Flight is available for Commodore 64/128, Apple II Family, IBM PC/Jr., and Atari L/XE and Macintosh computers. Suggested retail is only $34.95. For Macintosh nly — $39.95. Call or write for more information or MC/VISA orders.

MICRO PROSE
SIMULATION • SOFTWARE

20 Lakefront Drive Hunt Valley, Maryland 21030 301-667-1151

OMMODORE 64, ATARI, APPLE and IBM are registered trademarks of Commodore Business Inc., Atari c., Apple Computer Inc., and International Business Machines Inc., respectively.

Experience the reality of these other great simulations from Micro Prose:



The Thrilling Submarine Simulation

F-15 STRIKE EAGLE

Challenging and Exciting Air Combat from the Modern Electronic Cockpit!

Crusade in Europe

You are in Command – D-Day to the Battle of the Bulge!

this mode, every two bits corresponds to two pixels on the screen. Those two bits must share the same color, thus reducing the High-resolution mode by half. For example, the byte 00 01 10 11 in Bit-mapped mode will turn on to color 1 bits 3, 4, 6 and 7, and to color 0 bits 0, 1, 2 and 5. In Multicolor Bit-mapped mode, the same byte will turn on to color 0 bits 0 and 1 and to color 1 bits 2 and 3. To color 2, it will turn on bits 4 and 5 and to color 3, bits 6 and 7.

Print Screen Plus recognizes the hi-res screen as a bit-map screen, which is nice, even in Multicolor mode, because each of the four colors will be given a different shading. To see how your picture will appear on the screen, use the View option.

If you do not wish to type in the program listings, just send me a disk in a self-addressed stamped mailer, along with $5, and I will send you all three programs.

Note: C-64 Screen Print Plus will work with many of *RUN*'s previously published hi-res drawing programs. "Joystick Artist" (June 1984) is one such program. Also, this screen print program will work with "High Performance Turtle" (July 1985) and "Graphics Display System" (October 1985).

Enjoy the exciting world of C-64 graphics and Print Screen Plus! R

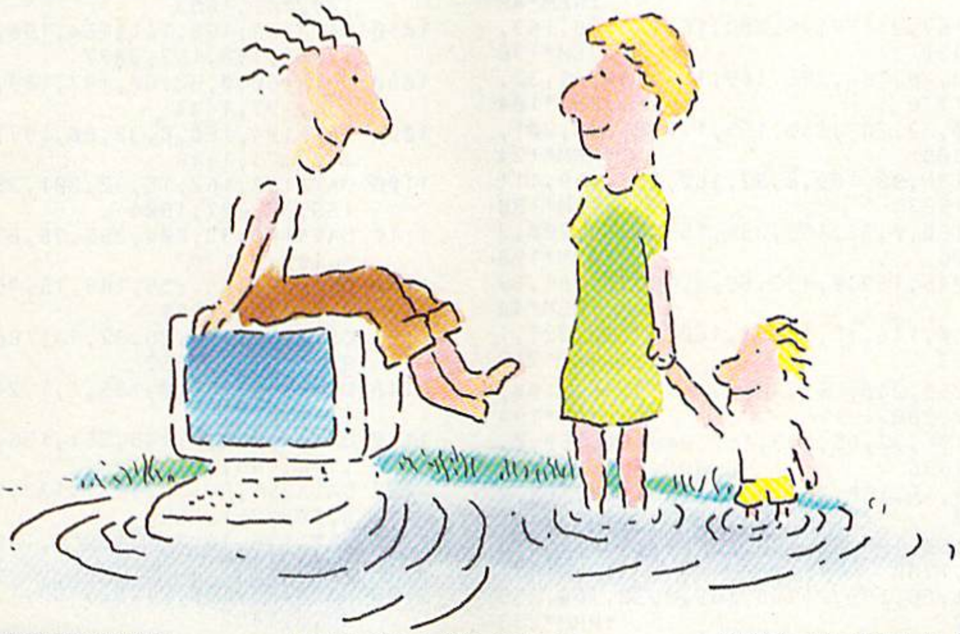
Address all author correspondence to Robin Franzel, 5521 Harvey Lane, Alexandria, VA 22312.

Listing 1. *Print Screen Plus program.*

```
10 DATA76,27,192,76,57,192,76,170,192,76,18
   0,192,1506                           :REM*192
20 DATA76,28,193,76,139,195,76,187,194,76,1
   33,194,1567                          :REM*122
30 DATA76,155,194,120,173,20,3,141,101,198,
   173,21,1375                          :REM*78
40 DATA3,141,102,198,169,74,141,20,3,169,19
   2,141,1353                           :REM*6
50 DATA21,3,169,0,141,100,198,88,96,120,173
   ,101,1210                            :REM*46
60 DATA198,240,9,141,20,3,173,102,198,141,2
   1,3,1249                             :REM*98
70 DATA88,96,173,100,198,208,12,160,3,165,1
   97,217,1617                          :REM*90
80 DATA131,192,240,6,136,16,248,108,101,198
   ,152,10,1538                         :REM*2
90 DATA168,185,135,192,141,118,192,185,136,
   192,141,119,1904                     :REM*130
100 DATA192,169,255,141,100,198,32,192,197,
    32,170,192,1870                     :REM*102
110 DATA32,165,197,169,0,141,100,198,108,10
    1,198,4,1413                        :REM*104
120 DATA5,6,3,170,192,139,195,187,194,140,1
    97,169,1597                         :REM*242
130 DATA4,162,4,160,0,32,186,255,169,0,32,1
    89,1193                             :REM*114
140 DATA255,32,192,255,144,3,104,104,96,162
    ,4,76,1427                          :REM*156
150 DATA201,255,173,17,208,41,32,240,3,76,2
    8,193,1467                          :REM*204
160 DATA32,143,192,169,0,133,251,173,136,2,
    133,252,1616                        :REM*66
170 DATA162,25,160,0,177,251,32,244,192,200
    ,192,40,1675                        :REM*38
180 DATA208,246,169,13,32,210,255,169,40,24
    ,101,251,1718                       :REM*118
190 DATA133,251,144,2,230,252,160,0,202,208
    ,225,169,1976                       :REM*138
200 DATA13,32,210,255,32,210,255,32,204,255
    ,169,4,1671                         :REM*22
210 DATA32,195,255,96,8,41,127,201,64,144,2
    ,9,1174                             :REM*90
220 DATA128,201,32,176,2,105,64,201,34,208,
    2,169,1322                          :REM*160
230 DATA39,40,16,12,72,169,18,32,210,255,10
    4,32,999                            :REM*32
240 DATA210,255,169,146,32,210,255,96,32,14
    3,192,32,1772                       :REM*98
250 DATA233,193,169,8,141,179,198,169,199,1
    41,62,3,1695                        :REM*56
260 DATA72,169,180,133,251,169,198,133,252,
    169,0,141,1867                      :REM*107
270 DATA60,3,141,61,3,104,141,62,3,72,160,1
    ,811                                :REM*153
280 DATA140,105,198,136,169,128,145,251,32,
    16,194,160,1674                     :REM*163
290 DATA0,177,253,45,64,3,240,7,177,251,13,
    105,1335                            :REM*207
300 DATA198,145,251,206,62,3,173,105,198,10
    ,141,105,1597                       :REM*161
310 DATA198,201,128,208,223,230,251,208,2,2
    30,252,238,2369                     :REM*13
320 DATA60,3,208,3,238,61,3,173,60,3,201,64
    ,1077                               :REM*11
330 DATA173,61,3,233,1,208,182,104,56,233,7
    ,144,1405                           :REM*3
340 DATA7,72,32,196,193,76,45,193,160,0,185
    ,180,1339                           :REM*187
350 DATA198,41,143,153,180,198,200,208,245,
    160,64,185,1975                     :REM*35
360 DATA180,199,41,143,153,180,199,136,16,2
    45,32,196,1720                      :REM*153
370 DATA193,160,4,185,93,198,32,210,255,136
    ,16,247,1729                        :REM*93
380 DATA32,204,255,169,4,76,195,255,169,179
    ,133,251,1922                       :REM*91
390 DATA169,198,133,252,160,0,177,251,32,21
    0,255,200,2037                      :REM*197
400 DATA208,248,230,252,162,65,177,251,32,2
    10,255,200,2290                     :REM*47
410 DATA202,208,247,169,13,32,210,255,96,17
    3,17,208,1830                       :REM*71
420 DATA41,32,240,22,173,0,221,41,3,168,185
    ,12,1138                            :REM*209
430 DATA194,141,99,198,173,24,208,41,8,240,
    8,173,1507                          :REM*25
440 DATA99,198,9,32,141,99,198,96,192,128,6
    4,0,1256                            :REM*203
450 DATA169,0,133,254,56,169,199,237,62,3,7
    2,41,1395                           :REM*125
460 DATA248,10,38,254,10,38,254,10,38,254,7
    2,141,1367                          :REM*243
470 DATA65,3,165,254,141,66,3,104,10,38,254
    ,10,1113                            :REM*83
480 DATA38,254,109,65,3,133,253,165,254,109
    ,66,3,1452                          :REM*73
490 DATA133,254,173,60,3,41,248,101,253,133
    ,253,173,1825                       :REM*235
500 DATA61,3,101,254,133,254,104,41,7,101,2
    53,133,1445                         :REM*99
510 DATA253,165,254,109,99,198,133,254,173,
    60,3,41,1742                        :REM*177
520 DATA7,170,189,179,194,141,64,3,96,169,1
    77,160,1549                         :REM*174
530 DATA0,174,136,2,132,251,134,252,162,4,1
    45,251,1643                         :REM*110
540 DATA200,208,251,230,252,202,208,246,96,
    120,173,17,2203                     :REM*46
550 DATA208,9,32,141,17,208,173,24,208,9,8,
    141,1178                            :REM*174
560 DATA24,208,32,109,194,88,96,120,173,17,
    208,41,1310                         :REM*74
570 DATA223,141,17,208,173,24,208,41,247,14
    1,24,208,1655                       :REM*118
```

→

GET YOUR FEET WET...



. . . IN THE INFORMATION AGE WITH THE DOW JONES NEWS/RETRIEVAL® MEMBERSHIP KIT. SAMPLE A CONTINUOUS STREAM OF KNOWLEDGE AT A PRICE YOU CAN AFFORD.

Now you and your whole family can experience the information age without getting in over your head.

For just $29.95, the new Dow Jones News/Retrieval Membership Kit leads you step-by-step into entertaining and informative data bases. With **five free hours** to sample and explore, you can find a fact, shop at home, get the scores, plan a trip, review a movie, choose a stock, or check world and business news. There's a lot more, too. All you need to get started is a computer and modem:

The Membership Kit is a big value that entitles you to:

- FREE password ($75 value)
- Easy, step-by-step User's Guide
- FIVE FREE HOURS of usage to explore the magic of this comprehensive service
- FREE subscription to *Dowline™*, the magazine of Dow Jones Information Services

Get your feet wet in the information age with the Dow Jones News/Retrieval Membership Kit. At $29.95, you'll enjoy the dip without getting soaked. Available at computer retailers and selected bookstores. For the location nearest you, call:

1-800-257-5114

In New Jersey, Canada and Alaska 1-609-452-1511

"Free time" offer limited to five(5) hours per household. Must be used within 30 days of receipt of password. Nominal service fee still applies.

A Great Holiday Gift!

> *"Toss away any preconception that Dow Jones News/Retrieval is a stuffy, one dimensional data base service designed only for an elite corps of stock analysts and Wall Street wizards. Far from it—Dow Jones News/Retrieval also provides entertaining movie reviews, current weather and sports reports, convenient electronic shopping and inexpensive electronic mail. . .Dow Jones News/Retrieval is informative, entertaining and well worth the money."*
> **-Brad Baldwin,** *InfoWorld* **Magazine**

Circle 51 on Reader Service card.

DOW JONES
NEWS/RETRIEVAL®

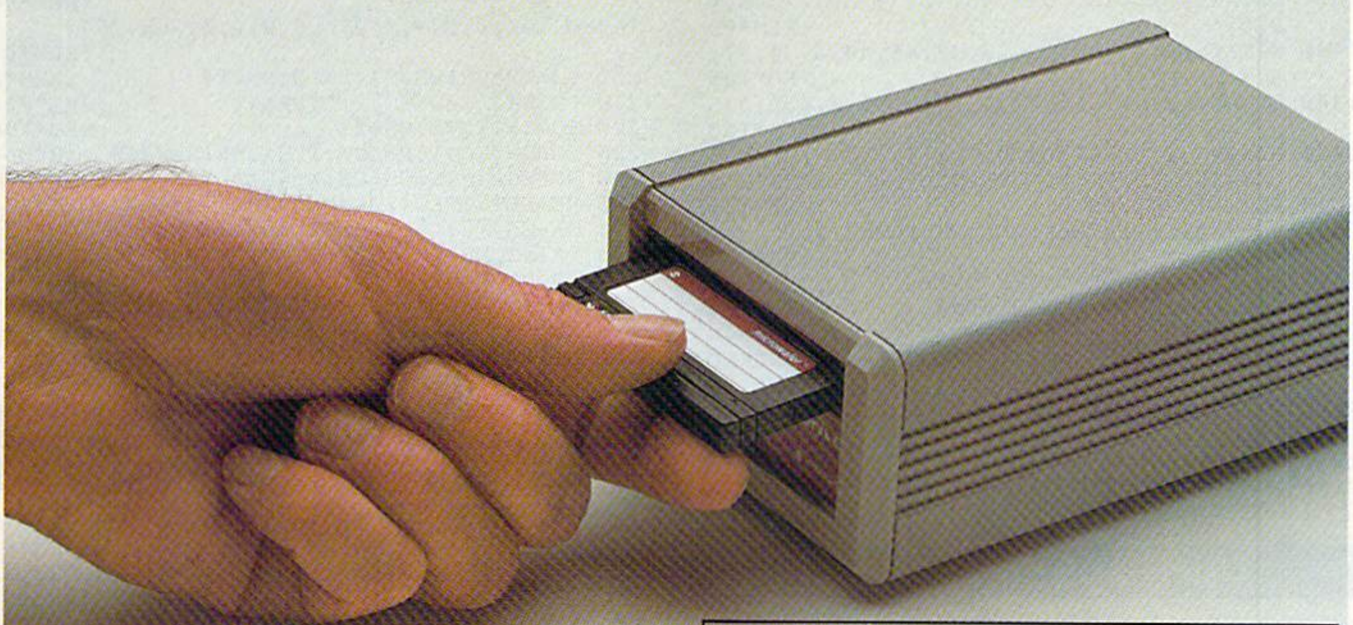
© 1985 Dow Jones and Company, Inc.
All Rights Reserved. Dow Jones News/Retrieval® is a registered service mark of Dow Jones and Company, Inc.

Listing 1 continued.

```
580 DATA169,32,32,111,194,88,96,128,64,32,1
    6,8,970                                :REM*162
590 DATA4,2,1,32,233,193,173,17,208,72,173,
    24,1132                                :REM*144
600 DATA208,72,32,155,194,169,21,141,24,208
    ,169,198,1591                           :REM*88
610 DATA160,33,32,227,196,32,65,195,169,0,1
    53,177,1439                            :REM*100
620 DATA2,152,170,160,0,185,177,2,240,47,20
    0,201,1536                             :REM*250
630 DATA32,240,246,138,162,177,160,2,32,189
    ,255,32,1665                            :REM*60
640 DATA57,195,32,35,195,169,0,133,251,173,
    99,198,1537                             :REM*90
650 DATA133,252,173,99,198,9,31,168,162,64,
    169,251,1709                           :REM*254
660 DATA32,216,255,32,46,195,32,87,195,120,
    104,141,1455                           :REM*138
670 DATA24,208,104,141,17,208,32,109,194,88
    ,96,162,1383                            :REM*98
680 DATA9,181,45,157,167,2,202,16,248,96,16
    2,9,1294                                :REM*42
690 DATA189,167,2,149,45,202,16,248,96,169,
    14,162,1459                            :REM*196
700 DATA8,168,76,186,255,169,198,160,61,32,
    227,196,1736                           :REM*104
710 DATA160,0,32,207,255,153,177,2,200,201,
    13,208,1608                            :REM*124
720 DATA245,136,96,169,8,32,180,255,169,111
    ,32,150,1583                           :REM*158
730 DATA255,160,0,32,165,255,153,69,3,200,2
    01,13,1506                             :REM*198
740 DATA208,245,169,0,153,69,3,160,0,185,69
    ,3,1264                                 :REM*44
750 DATA201,50,144,12,169,3,160,69,32,227,1
    96,32,1295                             :REM*212
760 DATA228,255,240,251,76,171,255,169,198,
    160,47,32,2082                         :REM*194
770 DATA227,196,32,65,195,152,240,30,169,0,
    153,177,1636                            :REM*13
780 DATA2,169,15,168,162,8,32,186,255,169,2
    ,162,1330                              :REM*161
790 DATA153,160,198,32,189,255,32,192,255,3
    2,87,195,1780                          :REM*171
800 DATA144,1,96,169,2,168,162,8,32,186,255
    ,169,1392                              :REM*233
810 DATA1,162,155,160,198,32,189,255,32,192
    ,255,32,1663                           :REM*109
820 DATA87,195,144,1,96,169,18,160,1,32,244
    ,196,1343                              :REM*185
830 DATA144,3,76,47,197,162,2,32,198,255,32
    ,207,1355                               :REM*43
840 DATA255,141,67,3,32,207,255,141,68,3,16
    9,188,1529                             :REM*117
850 DATA133,251,169,198,133,252,169,8,133,2
    53,160,0,1859                          :REM*153
860 DATA32,207,255,145,251,200,192,254,208,
    246,32,204,2226                        :REM*169
870 DATA255,160,0,177,251,201,129,240,45,20
    1,130,240,2029                         :REM*169
880 DATA41,24,169,32,101,251,133,251,165,25
    2,105,0,1524                            :REM*69
890 DATA133,252,198,253,208,227,172,68,3,17
    3,67,3,1757                             :REM*71
900 DATA208,167,169,198,160,16,32,227,196,3
    2,47,197,1649                           :REM*93
910 DATA32,228,255,240,251,96,141,132,198,1
    60,18,162,1913                         :REM*207
920 DATA15,177,251,157,133,198,136,202,16,2
    47,232,160,1924                        :REM*249
930 DATA0,185,133,198,201,129,208,1,200,189
    ,177,2,1623                            :REM*219
940 DATA240,13,217,133,198,208,178,232,200,
    192,15,208,2034                        :REM*157
950 DATA240,240,12,185,133,198,41,95,208,16
    3,200,192,1907                         :REM*175
960 DATA15,208,244,32,47,197,173,132,198,16
    0,80,201,1687                          :REM*107
970 DATA130,240,2,160,83,140,150,198,32,57,
    195,169,1556                            :REM*71
980 DATA20,162,133,160,198,32,189,255,32,19
    2,255,32,1660                          :REM*141
990 DATA204,255,169,198,160,80,32,227,196,1
    62,14,32,1729                          :REM*217
1000 DATA198,255,169,32,133,252,169,0,133,2
     51,168,162,1922                       :REM*161
1010 DATA31,134,253,173,132,198,201,130,208
     ,6,32,207,1705                        :REM*231
1020 DATA255,32,207,255,32,207,255,145,251,
     200,208,248,2295                       :REM*65
1030 DATA230,252,198,253,208,242,32,207,255
     ,145,251,200,2473                      :REM*44
1040 DATA192,64,208,246,32,204,255,169,14,3
     2,195,255,1866                         :REM*76
1050 DATA76,140,197,132,251,133,252,160,0,1
     77,251,240,2009                       :REM*234
1060 DATA6,32,210,255,200,208,246,96,72,169
     ,48,141,1683                           :REM*96
1070 DATA163,198,141,164,198,141,166,198,14
     1,167,198,152,2027                    :REM*228
1080 DATA160,0,32,60,197,169,198,160,166,32
     ,73,197,1444                          :REM*158
1090 DATA104,160,0,32,60,197,169,198,160,16
     3,32,73,1348                          :REM*244
1100 DATA197,162,15,32,201,255,169,198,160,
     156,32,227,1804                        :REM*46
1110 DATA196,32,204,255,76,87,195,32,204,25
     5,169,2,1707                           :REM*98
1120 DATA32,195,255,169,15,76,195,255,133,9
     9,132,98,1654                         :REM*124
1130 DATA162,144,56,32,73,188,76,221,189,13
     2,251,133,1657                          :REM*6
1140 DATA252,160,0,185,1,1,240,13,72,200,18
     5,1,1310                              :REM*192
1150 DATA1,240,7,145,251,136,104,145,251,96
     ,104,145,1625                         :REM*174
1160 DATA251,96,132,251,133,252,160,2,169,4
     8,145,251,1890                         :REM*58
1170 DATA136,16,251,162,0,189,1,1,240,3,232
     ,208,1439                               :REM*4
1180 DATA248,160,2,202,189,1,1,145,251,202,
     48,3,1452                             :REM*202
1190 DATA136,16,245,96,32,133,194,165,197,2
     01,60,240,1715                        :REM*234
1200 DATA8,205,131,192,208,245,32,170,192,3
     2,155,194,1764                        :REM*248
1210 DATA169,0,133,198,96,160,25,185,106,19
     8,153,217,1640                        :REM*180
1220 DATA0,136,16,247,24,174,103,198,172,10
     4,198,32,1404                         :REM*160
1230 DATA240,255,169,253,160,251,208,25,160
     ,25,185,217,2148                       :REM*22
1240 DATA0,153,106,198,136,16,247,56,32,240
     ,255,142,1581                         :REM*128
1250 DATA103,198,140,104,198,169,251,160,25
     3,140,2,198,1916                       :REM*54
1260 DATA141,4,198,169,0,133,253,173,136,2,
     133,254,1596                          :REM*118
1270 DATA169,188,133,251,169,198,133,252,24
     ,169,64,101,1851                      :REM*220
1280 DATA251,133,251,169,1,101,252,133,252,
     162,4,160,1869                         :REM*89
1290 DATA0,177,253,145,251,136,208,249,230,
     254,230,252,2385                       :REM*15
1300 DATA202,208,242,96,13,70,73,76,69,32,7
     8,79,1238                              :REM*19
1310 DATA84,32,70,79,85,78,68,13,0,147,83,6
     7,806                                  :REM*47
1320 DATA82,69,69,78,32,83,65,86,69,13,0,14
     7,793                                 :REM*255
1330 DATA83,67,82,69,69,78,32,76,79,65,68,1
     3,781                                  :REM*69
```

→

A QUICK DATA™ DRIVE IS 20 TIMES FASTER THAN AUDIO CASSETTES, LOADS FASTER THAN A COMMODORE DISK DRIVE, AND COSTS $84.95.



MONEY-SAVING PACKAGES

THE MICROWAFER OFFICE: $139.95
Includes: 170K Quick Data Drive ($84.95); Word Manager word processor ($34.95); Plan Manager spread sheet ($34.95); the Speed File file manager ($69.95). A $189.85 value for $139.95.

THE MICROWAFER TEACHER: $129.95
Includes: 170K Quick Data Drive ($84.95); General Math; Spelling; plus Typing Tutor. A $159.80 value for $129.95.

THE MICROWAFER ENTERTAINER: $119.95
Includes: 170K Quick Data Drive ($84.95); plus, three of the most popular game programs for Commodore computers. A $174.80 value for $119.95.

THE PHANTOM QOS PACKAGE: $99.95
Includes: 170K Quick Data Drive ($84.95); Phantom QOS ROM Cartridge that quickly loads and locates the operating system in ROM outside the computer's main memory ($29.95). A $114.90 value for $99.95.

Unbelievable? Believe it. The Quick Data Microwafer™ Drive is a **new drive technology** that loads a 24K program in 20 seconds vs. 8 minutes for a cassette drive or 1 minute for a Commodore Disk Drive.

Unbeatable price. One 170K drive: $84.95. Two drive 340K system: $154.95. Factory direct, with a full 30-day guarantee. If you're not delighted with your Quick Data Drives, return them within 30 days for a full refund. No questions asked.

Software included. All Quick Data Drives come with the QOS™ operating system, system utilities and easy-to-use instructions. Plus a blank Microwafer. You can be up and running in about five minutes.

Lots of software. Dozens of leading programs are available on Microwafers. Or, you can use Entrepo QOS to copy your existing Basic Programs to Microwafers from either cassette or diskette.

Mix-and-match. You can daisy-chain the Quick Data Drive with your existing cassette recorder by plugging it into the cassette port, or, use two QDD's linked together for dual drive capability. No problem.

Unconditional Guarantee: If you are not completely satisfied with your Quick Data Drive System, return it to Entrepo, Inc., within 30 days for a full refund. Your system is also covered by a 90 day warranty against failures or defects in manufacture.

Microwafer™ and Quick Data Drive™ are trademarks of Entrepo, Inc. Commodore® 64™ is a trademark of Commodore International, Inc.

© 1985 Entrepo, Inc. Circle 30 on Reader Service card.

ORDERING DIRECT FROM ENTREPO.

Commodore® 64™ owners. Call us at the toll free number below. Give us your VISA or MasterCard Credit Card number, tell us which package you want. It will be on its way to you the following day. Simple as that. Allow $3.00 for shipping and postage. Really fast delivery? Add $10 for overnight package express.

TOLL FREE ORDERING: 1 (800) 231-0251
IN CALIFORNIA 1 (800) 648-4114

entrepo

Listing 1 continued.

```
1340 DATA0,13,69,78,84,69,82,32,70,73,76,69
     ,715                              :REM*91
1350 DATA78,65,77,69,58,32,32,0,13,76,79,65
     ,644                             :REM*251
1360 DATA68,73,78,71,46,46,46,13,0,13,13,13
     ,480                             :REM*153
1370 DATA15,13,0,0,0,0,0,0,0,0,0,0,28
                                      :REM*223
1380 DATA0,0,0,0,0,0,0,0,0,0,0,0,0 :REM*247
1390 DATA0,0,0,0,0,0,0,0,0,0,0,0,0   :REM*1
1400 DATA0,0,0,0,0,0,0,0,0,0,0,0,0  :REM*11
1410 DATA0,0,0,0,0,44,80,44,82,73,48,35,406
                                        :REM*7
1420 DATA85,49,32,50,32,48,32,49,50,32,48,4
     8,555                             :REM*95
1430 DATA0,66,45,80,32,50,32,48,48,49,0,27,
     477                              :REM*185
1440 DATA64,27,51,16,27,75,64,1,0,0,0,0,325
                                      :REM*103
2000 SA=49152:BE=SA:L=10:NL=144        :REM*43
2010 PRINT"LOADING...":PRINT          :REM*215
2020 FORI=1TONL:CS=0                  :REM*121
2030 FORJ=0TO11:READK:IFK>255THEN2100
                                       :REM*59
2040 POKESA+J,K:CS=CS+K:NEXT          :REM*249
2050 READLT:IFLT<>CSTHEN2100          :REM*154
2060 SA=SA+12:L=L+10:NEXT              :REM*46
2070 PRINTCHR$(17)SPC(6)"COMMODORE 64 HIRES
      UTILITY"                        :REM*136
2080 PRINTCHR$(17)SPC(12)"BY ROBIN FRANZEL"
                                       :REM*34
2090 SYSBE:NEW                          :REM*2
2100 PRINT"ERROR IN DATA STATEMENT #";L
                                      :REM*100
```

Listing 2. *Gemini 10X conversion program.*

```
10 DATA173,148,192,72,169,4,141,148,192,32,
   143,192,1606                       :REM*232
20 DATA104,141,148,192,32,233,193,24,169,64
   ,109,187,1596                      :REM*178
30 DATA193,141,217,193,169,0,133,253,173,99
   ,198,133,1902                      :REM*194
40 DATA254,169,198,133,252,169,179,133,251,
   24,173,187,2122                    :REM*152
50 DATA193,101,251,133,251,169,25,141,184,1
   93,169,40,1850                     :REM*158
60 DATA141,186,193,160,7,177,253,153,188,19
   3,136,16,1803                       :REM*18
70 DATA248,160,8,140,185,193,169,0,162,0,10
   ,30,1305                           :REM*156
80 DATA188,193,105,0,232,224,8,208,245,160,
   0,145,1708                         :REM*224
90 DATA251,230,251,208,2,230,252,206,185,19
   3,208,226,2442                     :REM*212
100 DATA24,165,253,105,8,133,253,144,2,230,
    254,206,1777                      :REM*242
110 DATA186,193,208,195,32,196,193,169,198,
    133,252,169,2124                  :REM*242
120 DATA179,133,251,24,173,187,193,101,251,
    133,251,206,2082                  :REM*142
130 DATA184,193,208,166,32,204,255,169,4,76
    ,195,255,1941                      :REM*96
140 DATA0,0,0,9,0,0,0,0,0,0,0,255,264
                                       :REM*44
200 SA=49436:BE=SA:L=10:NL=14           :REM*2
210 PRINT"LOADING...":PRINT           :REM*200
220 FORI=1TONL:CS=0                   :REM*106
230 FORJ=0TO11:READK:IFK>255THEN300    :REM*4
240 POKESA+J,K:CS=CS+K:NEXT           :REM*234
250 READLT:IFLT<>CSTHEN300            :REM*234
260 SA=SA+12:L=L+10:NEXT               :REM*31
270 PRINTCHR$(17)SPC(6)"HIRES SPECIAL PRINT
    ER ROUTINE"                        :REM*43
280 PRINTCHR$(17)SPC(15)"INSTALLED" :REM*69
290 NEW                               :REM*173
300 PRINT"ERROR IN DATA STATEMENT #";L
                                       :REM*85
```

Listing 3. *Machine language conversion for Print Screen Plus program.*

```
10 DATA 169,9,162,93,160,3,32,189,255,169
                                       :REM*82
20 DATA 8,168,170,32,186,255,169,192,133,25
   2                                   :REM*20
30 DATA 169,0,133,251,162,188,160,198,169,2
   51                                 :REM*170
40 DATA 76,216,255,72,73,82,69,83,85,84,73,
   76                                  :REM*98
50 FORI=828TO869:READA:POKEI,A:NEXT:REM*238
60 PRINT"PLACE DISK TO SAVE HIRES IN DRIVE.
                                       :REM*84
70 PRINT"{3 SPACEs}PRESS ANY KEY WHEN READY
   .                                  :REM*100
80 GETA$:IFA$=""THEN80                :REM*158
90 SYS828:NEW                         :REM*162
```

PEOPLE SAY THE NICEST THINGS ABOUT WORDPRO 64 TM

"Well thought out and easy to use" — W.H., Halifax N.S.
"By far the best..." — R.H., Oneonta N.Y.
"A remarkable product - the most powerful word processing program I have ever seen." — J.H., Nantucket Mass.
"I will not hesitate to give unqualified endorsement." — B.W., Gig Harbour Wa.

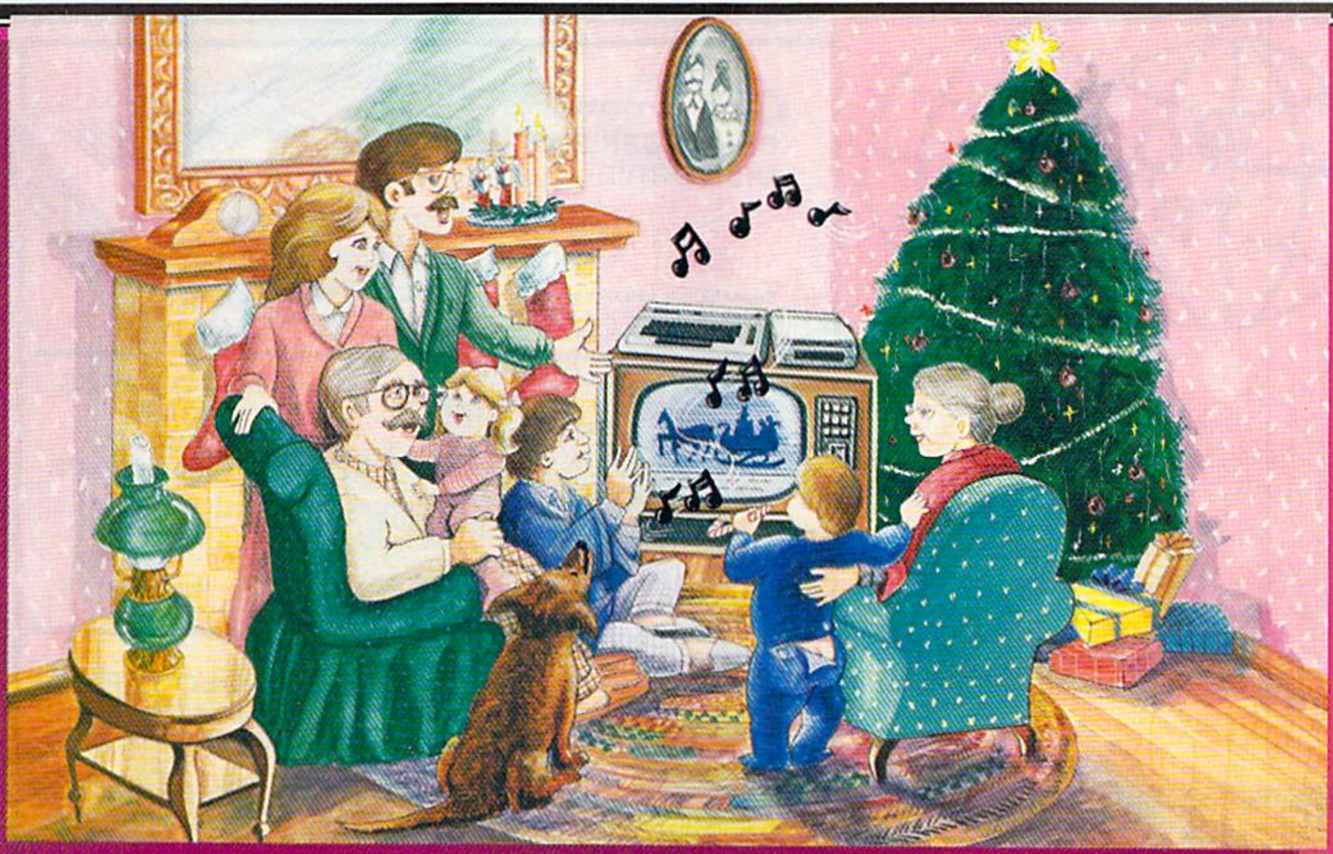
Toll Free Order Line

1-800-387-3208

VISA MasterCard

PRO·LINE SOFTWARE

755 The Queensway East, Unit 8, Mississauga, Ontario, Canada L4Y 4C5 . Phone 416-273-6350

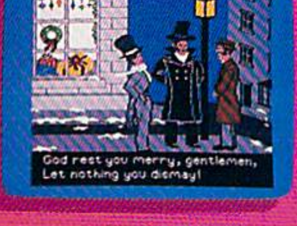


Sing Along With Your Favorite Christmas Carols

Here's a great way for you and your family to have fun with your Commodore 64™ or Commodore 128™ this Christmas. Our exciting Christmas Carols disk features 18 of your favorite holiday songs, with professionally-arranged music and entertaining graphics. For sing along fun, the lyrics appear in easy-to-read verse on your TV or monitor. Play just your favorite song or set your computer to play them all.

SONGS INCLUDE:

- Angels We Have Heard on High • Deck the Hall
- O Come All Ye Faithful • Away in a Manger
- The First Noel • God Rest You Merry, Gentlemen
- Hark! The Herald Angels Sing • O Holy Night
- It Came Upon The Midnight Clear • Jingle Bells
- O Little Town of Bethlehem • We Three Kings of Orient Are
- Jolly Old St. Nicholas
- Joy to the World
- O Christmas Tree
- Silent Night
- What Child is This?
- Up on the Housetop



God rest you merry, gentlemen,
Let nothing you dismay!

An Actual Screen

John Henry Software®

QUALITY IS OUR STRENGTH

and Party Songs

For fun on New Year's Eve and throughout the year, order our Party Songs. The disk contains 18 favorites, including Auld Lang Syne, Dixie, For He's a Jolly Good Fellow, Oh! Susanna, Yankee Doodle, and more.

You can trust John Henry Software to bring you quality software at the lowest price. We specialize in prompt delivery and guarantee our product.

Don't wait, call us today! Toll Free Number:

1-800-223-2314

in Ohio call 513-898-7660

$\$15^{95}$ each

Both for only $28.95

Please send me:

_____ Christmas Carols disk(s) at $15.95 each
_____ Party Songs disk(s) at $15.95 each
_____ Christmas Carols and Party Songs at $28.95

Add $1.00 for postage and handling. Ohio residents add 6% sales tax. Foreign orders, except Canada and APO, add $3.00 for Air Mail. Please pay in U.S. funds.

☐ Check or money order enclosed ☐ Visa ☐ MasterCard

Acct. # ______________________ Exp. Date _______

Name ______________________________

Address ______________________________

City ______________ State _______ Zip _______

Send to John Henry Software, P.O. Box 745, Vandalia, Ohio 45377

Circle 42 on Reader Service card.

WORLD TRADE

Make us an offer we can't refuse!

WE'LL SHOW YOU OUR ACTUAL COST OF MERCHANDISE YOU MAKE US A REASONABLE OFFER... YOU'LL GET THE BUY OF A LIFETIME!

NEW FOR
commodore
ENHANCER 2000
DISK DRIVE
$159.95

Super high speed slim sign construction commodore compatable direct drive motor.

SUPER SPECIAL!

maxell XLII 90
TDK SA
90

AUDO TAPES
TDK-SA90
MAXELL XL2
YOUR CHOICE
1.99
EA.
Min. purchase 10

JVC
T-120
DYNAREC
Panasonic
PREMIUM STD
T-120

VIDEO TAPES
TDK T120
SCOTCH T120
JVC T120
PANASONIC T120
YOUR CHOICE
4.39
EA.
Min. purchase 10

SUPER SPECIAL!

MODEMS
ANCHOR HIGH SPEED
1200-BAUD
VOLKSMODEM-12
$179.95
(COMMODORE COMPATABLE)

NASHUA
9.95

ELEPHANT
11.95

SCOTCH
12.95

MIX OR MATCH 10 BOXES
& GET 60 DISK HOLDER FREE!

You Set the Price

5 SUPER SIZE STORES

PATCHOGUE
437 Sunrise Hwy.
516-475-0560

BAYSIDE
191-28 Northern Blvd.
718-539-9555

W. BABYLON
358 Sunrise Hwy.
516-587-1010

NEW HYDE PARK
2075 Jericho Tpke.
516-437-3020

SYOSSET
27 Jackson Ave.
516-921-5454

VISA
MasterCard
C.O.D.

Circle 42 on Reader Service card.

commodore 128
PERSONAL COMPUTER

128K Expandable to 512K 40 and or 80 column full color display Professional typewriter keyboard with full numeric keypad. Built-in basic Full CP/M Plus

OUR COST **$268**

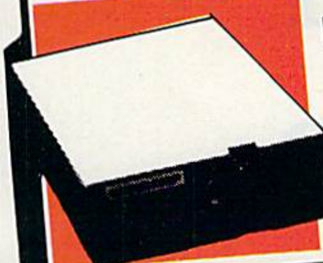
OUR PRICE $319

Color 13" Monitor 1 Year Parts & Labor

TEKNIKA COMPOSITE MONITOR

OUR PRICE $169

OUR COST **$142**



BLUE CHIP
DISK DRIVE

OUR COST **$134**

OUR PRICE $169

100 Commodore compatible. Reads & writes programs faster than Commodore disk drive Enhanced *technology enables the BCD/5 25 to be more compact. use less power & gives off less heat

BLUE CHIP
M120/NLQ PRINTER

Near letter quality button Tractor/friction. 120cps/25cps. NLQ.

OUR COST **$179**

OUR PRICE $199

WORLD TRADE COMPUTER WHOLESALERS

MAIL ORDERS TO: WORLD TRADE 2075 JERICHO TURNPIKE, NEW HYDE PARK, NEW YORK 11040

SPECIAL SOFTWARE FOR THE 128 TIME WORKS

	Our Cost	Our Price
Data Manager	36.93	69 95
Swiftcalc with sideways	36.93	69 95
Word Writer with Spell checker	36.93	69 95

CBS SOFTWARE FOR COMMODORE 64

Grand prize $10,000 cash for tuition. 1st prize $1,000 educational software 2nd prize $100 each for school supplies Plus...with proof of purchase you will get $10 rebate on CBS software's Easy Key programs.

	Our Cost	Our Price
Dr. Seuss Fix Up The Mix-Up Puzzle	17.00	29 95
Many ways to say I Love You	17.00	29 95
Astro-grover	20.00	34 95
Big Bird's Funhouse	20.00	34 95
Ernie's Magic Shapes	14.00	24 95
Weather Tamers	11.00	19 95
Forcast	28.00	49 95
Dinosaur dig	23.00	39 95
Coast to Coast	23.00	39 95
Mastering the SAT	47.94	77 95
Success with Math Series	15.00	24 95
Success with Algebra Series	20.00	34 95
Muppet Learning Keys	52.00	89 95

WORD PROCESSING

	Our Cost	Our Price
Fleet system 2 w/70,000 Word spellpak	50.00	89 95
Front master	12.00	24 95

MODEMS

	Our Cost	Our Price
Video 7	40.00	79 95
Miley Mo (1 hour free compuserve time)	55.00	89 95
West Ridge	54.00	89 95

ACCESS SOFTWARE

	Our Cost	Our Price
Neutral Zone	20.00	34 95
Mach 5	21.00	34 95
Beach-Head II	24.00	34 95

TIMEWORKS SOFTWARE

	Our Cost	Our Price
Data Manager II	29.97	49 95
Evelyn Wood Dynamic Reader	29.97	49 95
Work Writer with Spellcheck	29.97	49 95
Swifcalc w/Sideways	29.97	49 95
Cave of the Word Wizards	20.97	34 95

EPYX SOFTWARE

	Our Cost	Our Price
Hot Wheels	17.97	29 95
Summer Games II	19.00	39 95
Fast Load	19.00	29 95
Barbie	17.97	29 95
Breakdance	19.00	29 95
Baseball	19.00	34 95
Pitstop II	19.00	34 95
9 to 5 Typing	23.97	34 95

INTERFACES

		Our Price
Xetec Super Graphix 8K Buffer 10 printing modes	50.00	89 95
Super Graphix Jr.	30.00	59 95
Tymac Connection G-Wiz	45.00	69 95

DISKETTES

FREE EXTRA DISK INSIDE
Featuring Success with Math, and Success with Algebra by CBS.
(For Commodore Only!)

	Our Cost	Our Price
Elephant (box of 10) DD/DS	10^{50}	11^{95}
Nashau DD/DS (box of 10)	9.00	12 95
Nashua diskettes 3½" DD/SS (box of 10)	8.00	14 95
Nashua (box of 10) DD/SS	22.50	34 95
Scotch (3M) (box of 10) DD/SS	10.99	14 95
Scotch Head Cleaner Kit	8.70	14 95

NEW! NIBBLE NOTCH

Turns your 5½" single Disk into A 2 Sided Disk

Our Cost **$5**

Our Price $14^{95}

DISK FILES

	Our Cost	Our Price
10 Disk Holder	4.70	7 00
60 Disk Holder (stackable)	8.00	14 95

MONITORS

	Our Cost	Our Price
Commodore 1702	168.00	189 00
Sharp 13" Color Compsite	148	169 00
Sharp green 12"	50.00	79 00
Sharp amber 12"	55.00	89 00
Teknika RGB/Composite 13"	225	275

JOYSTICKS

	Our Cost	Our Price
Wico Boss	9.00	19 95
Wico Bat	11.00	15 95
Wico Threeway	18.00	27 95
Gim 1000-left/right firing button	7.00	14.95

PRINTERS

	Our Cost	Our Price
Blue Chip M150/10 Tractor/Friction 130pcs	180.00	249 00
Blue Chip M150/15 StarSG10 Tractor/Friction 130cps.	195.00	259 00
Blue Chip 120/NLQ	175.00	239 00
Blue Chip 120/NLQ	180.00	249 00
SG10-C w/built in Commodore interface	210.00	269 00
Okimate 10 color	180.00	249 00
Legende 808	148.00	179 95
Legende 880	205.00	239 95
Legende 1080	227.00	269 95
Legende 1380	272.00	300 95
Legende 1385	342.00	379 95

COMPUTER PRINTOUT PAPER

PAPER & RIBBON

Delivery on paper included in price

paper size 9½ x 11"

1000 x 3 boxes Microperf	35.00	70 00
2700 microperf	28.00	62 00
Ribbon bluechip M120/M150	7.00	14 95
Ribbon SG10/SG15/ Okidate 82A	2.00	4 95

SURGE PROTECTORS

	Our Cost	Our Price
6 Outlet with lighted switch	17.00	29 95
Surge Plus	22.00	34 95

NEW! MINDSCAPE INC. PRESENTS "THE HALLEY PROJECT: A MISSION IN OUR SOLAR SYSTEM" ...... CALL
FOR USE WITH BOTH ATARI & COMMODORE

TO ORDER CALL
OUTSIDE N.Y.
1-800-722-4002
ORDER LINE ONLY

NEW! BIG FIVE SOFTWARE PRESENTS "BOUNTY BOB STRIKES BACK!" ...... CALL
FOR USE WITH BOTH ATARI & COMMODORE

IN NEW YORK 1-718-895-2388
WHEN IN THE NEW YORK AREA VISIT OUR 5 BIG L STORES.
• West Babylon • New Hyde Park • Syosset • Patchogue • Bayside

Check, Money Order, MC or VISA accepted/Call for shipping and handling information / NYS residents add applicable sales tax / Prices and availability are subject to change without notice / Air factory fresh merchandise with manufacturer's warranty. Dealers welcome. Call for recent price reductions and new rebate information. No returns without prior authorization.
FOR INFORMATION & CUSTOMER SERVICE CALL 1-718-895-2388.

VISA MasterCard C.O.D.

Sprite Control In C-128 Mode

A discussion of Basic 7.0's sprite commands and functions and a demonstration of their impressive capabilities.

By LOUIS R. WALLACE and DAVID P. DARUS

The Commodore 128 has perhaps the most powerful Basic language ever supplied with a microcomputer—Basic 7.0. The language comes equipped with a large assortment of commands, including many for sprite graphics, thus simplifying sprite creation and movement.

The C-128 has eight sprites, or movable object blocks, just like the C-64. Each can be defined as high resolution or multicolor. However, unlike the C-64, there are high-level commands and functions that let you express your creativity without the hassle of using Pokes or calculating bytes.

There are a total of ten separate commands and functions that control sprites. In addition, there are other commands you can use to enhance your sprite programs.

Making Sprites

For starters, the C-128 comes equipped with a resident sprite editor. This allows you to make high-resolution and multicolor sprites from Direct mode. Simply type SPRDEF, and you'll be whisked away to the sprite editor and asked for a sprite number. This is the number of the sprite you wish to design (1–8).

Once you choose the sprite number, the sprite grid is activated. The dimensions of the grid are 24 × 21 for high resolution and 12 × 21 for multicolor. To design a multicolor sprite, press M; the grid toggles to 12 × 21 pixels. Press M again, and the grid reverts to high resolution. You can move around the grid with the cursor keys, clear the sprite with the CLR key and change colors with the CTRL and CBM keys.

To select colors for your sprite, press numbers 1–4. 1 is background; 2 is foreground; 3 is multicolor 1; 4 is multicolor 2. Once you've finished making the sprite, simultaneously press the shift and return keys and the sprite will be stored in memory, ready for use. You can then enter another sprite number if you want to make another sprite, or press the return key to return to the normal C-128 mode.

To use the sprite in your program, you begin by defining its characteristics (i.e., color, priority and expansion). To handle that, Basic 7.0 provides the Sprite command, which has seven parameters: sp#, on/off, color, priority, x-expansion, y-expansion and mode. You can accomplish with one command what would normally have required six statements and, therefore, more programming time and computer memory and slower program-execution speed.

For example, look at the statement

```
SPRITE 1,1,6,1,1,0,1
```

The first and second "1" take sprite 1 and turn it on (1 is on , 0 off); the "6" makes it green (colors 1–16); the next "1" makes it appear in front of screen data (priority 0 = behind, 1 = in front); the following "1" expands it in the x direction (1 = expanded, 0 = normal); the 0 prevents

it from being expanded in the y direction (1 = expanded, 0 = normal); and the final 1 makes it a multicolor sprite (0 = high resolution, 1 = multicolor). That's a lot of work for one command.

To set the extra colors for multicolor sprites, you use the command

```
SPRCOLOR <mc1,mc2>
```

where mc1 and mc2 are the extra colors for multicolor sprites. These colors are shared among the eight sprites.

Basic 7.0 allows for absolute sprite addressing. MOVSPR, an extremely versatile action command, has four forms, each of which is a powerful sprite command.

The first is

```
MOVSPR <sp#,x,y>
```

where sp# indicates which sprite you want to move, and x and y are the screen coordinates where you want to position the sprite.

The second form is

```
SPRMOV <sp#,+/- x,+/- y>
```

This is a relative sprite-addressing mode, where the sprite is moved a given distance from its current position.

The third form is

```
SPRMOV <sp#,dx;ay>
```

This moves the sprite a specified distance (x) at any given angle (y). The semicolon (;) signifies mode 3.

The last form,

```
MOVSPR <sp#,xa #>
```

is perhaps the most powerful. This command allows automatic motion of a sprite. The sprite is moved at angle x at a speed of n (0–15). This motion continues until you tell it to stop. With this technique, arcade games become much easier and faster.

As an additional aid in sprite programming, there is the Collision command, which allows program branching when certain types of interrupts occur. The format is

```
COLLISION <type,line#>
```

where "type" may be one of three.

Type 1 indicates when sprite–sprite collisions occur; type 2 is for sprite–screen graphic collisions; and type 3 is a light-pen interrupt. When the given interrupt occurs, Basic finishes the statement on which it's working and begins execution at the line specified in the line#. You may have more than one interrupt enabled at the same time.

You also have the function Bump (n), where, if n = 1, then the program will indicate which sprites have had a collision with other sprites, and, if n = 2, the program will return a value indicating which sprites have collided with screen graphics.

Another interesting command is SPRSAV, which allows you to save a sprite as a string variable and a string variable as a sprite. This allows you to store many sprites as variables in memory, to be recalled as needed.

If you combine this command with the graphics commands GSHAPE and SSHAPE, which allow a section of the graphics screen to be stored as a variable or written back to the screen from a variable, you have the ability to retrieve a piece of graphics screen and transfer it to a sprite for animation or to copy a sprite to the screen, where it could be made part of the background until needed again.

There are also several sprite functions that return information about a sprite's speed, position, color and other characteristics. One of these functions is

```
RSPCOLOR <mc#>
```

where mc# is either 1 or 2, depending on which color you prefer. It returns a value equal to the current color.

Another function is

```
RSPPOS <return,sp#,speed/position>
```

which returns the x or y position and the current speed of the specified sprite.

RSPRITE <sp#,ch#> with sp# = (1–8) and ch# = (0–5)
returns a specified characteristic from a specified sprite.
RSPPOS <sp#,speed/position> where speed/position is 00–2,
0 returns sprite x position; 1 returns sprite y position;
2 returns sprite speed (0–15).
RSPCOLOR <mc#> where mc# is 1–2,
1 gives sprite multicolor 1; 2 gives sprite multicolor 2.
BUMP <n> where n is 1–2,
1 indicates which sprites have collided with each other;
2 indicates which sprites have collided with background graphics.

Table 1. *Sprite functions for the program.*

SPRSAV <sp#,var$>** or **SPRSAV <var$,sp#> where sp# is sprite number and var$ is string variable. The format is {**SPRSAV source,destination**}
SPRITE <sp#,o/f,col,pr,xp,yp,mode>
sp# is sprite number 1–8.
o/f is on/off; 1 = on, 0 = off.
col is color, 1–16.
pr is priority; 0 = sprites in front, 1 = sprites in back.
xp is x-expansion; 1 = expanded, 0 = normal;
yp is y-expansion; 1 = expanded, 0 = normal;
mode is 0 = hires, 1 = multicolor.
SPRCOLOR <mc1,mc2>
mc1 = multicolor 1 for all sprites;
mc2 = multicolor 2 for all sprites.
MOVSPR has four forms:
MOVSPR <sp#,x,y>—Absolute x and y position
MOVSPR <sp#,+/- x,+/- y>—Relative x and y position
MOVSPR <sp#,dx;ay>—Moves sprite x distance at y angle
MOVSPR <sp#,xa #n speed>—Moves sprite at angle x and speed (0–15)
COLLISION <type,line#>
type is 1–3
1 = sprite/sprite collision
2 = sprite/graphic collision
3 = light pen trigger interrupt request
SPRDEF—Built-in sprite editor for standard or multicolor sprites.

BSAVE allows sprites to be saved as easily loaded binary files.

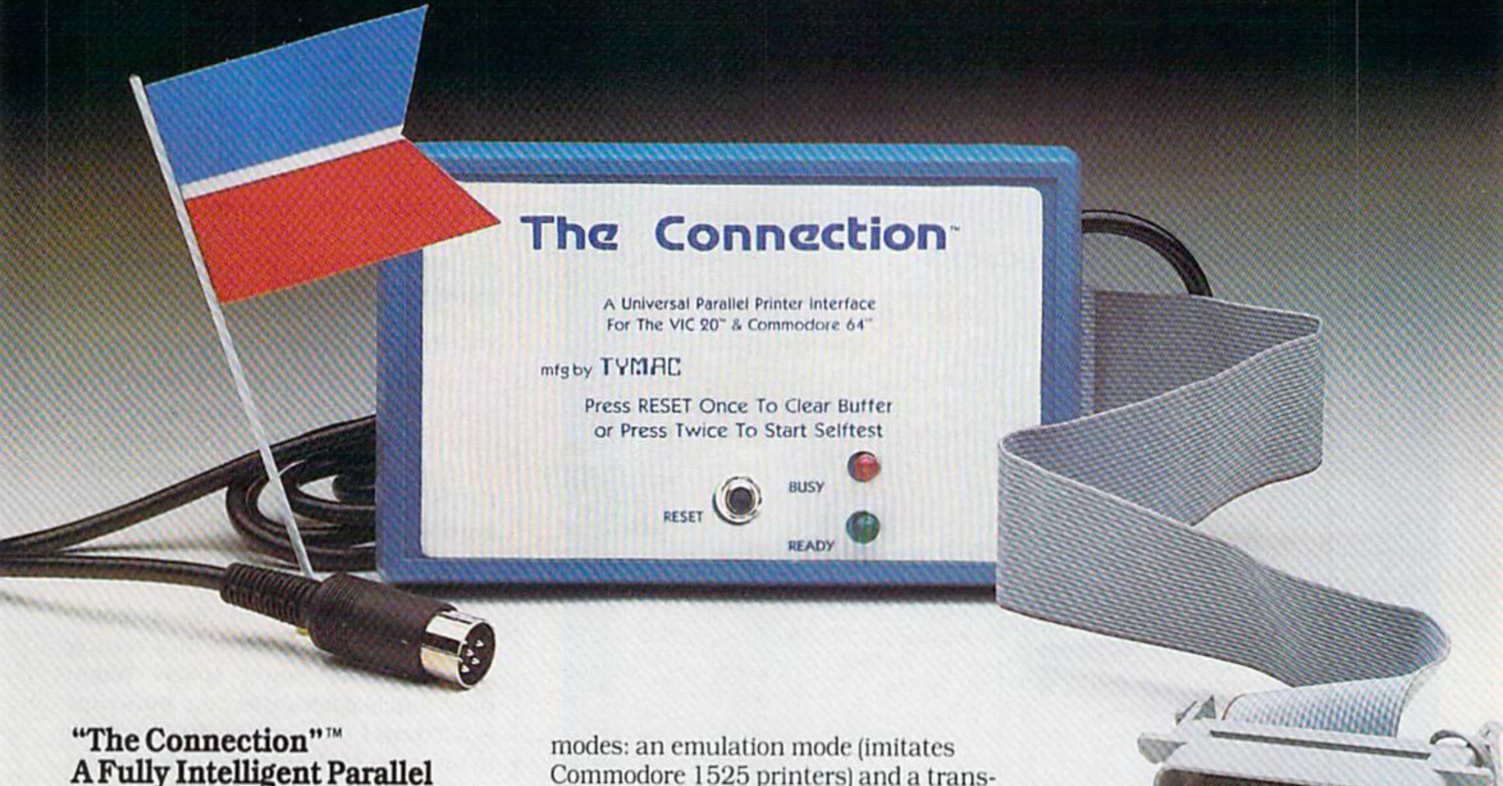
BLOAD allows sprite binary files to be easily loaded into memory.

SSHAPE <string variable,X1,Y1,X2,Y2>—Saves a given area of the hi-res screen as a string variable. It can be restored to the screen with **GSHAPE <string variable, x1,y1,mode>** or used as a sprite with SPRSAV.

Table 2. *Sprite commands for the program.*

TYMAC PRINTER INTERFACES GIVE YOU MORE FOR YOUR MONEY...

And That's What It's All About


The Connection™
A Universal Parallel Printer Interface
For The VIC 20™ & Commodore 64™
mfg by TYMAC
Press RESET Once To Clear Buffer
or Press Twice To Start Selftest
BUSY
RESET
READY

"The Connection"™ A Fully Intelligent Parallel Printer Interface for Commodore® Computers

Now, TYMAC provides a parallel printer interface designed exclusively for Commodore Computers, including Commodore 64™, Commodore 128™, Plus/4™, Commodore 16™ and VIC 20®. TYMAC's "The Connection" gives you complete control over your printing capabilities and offers you top-notch quality, unequalled by other interfaces of its kind. "The Connection" is compatible with virtually all Commodore software.

"The Connection" makes your investment in a printer interface worthwhile. "The Connection" simply plugs into the serial disk port to ultimately produce refined, finished documents. TYMAC has applied leading computer technology to equip "The Connection" with two modes: an emulation mode (imitates Commodore 1525 printers) and a transparent mode (information goes straight through—no interpretation). For a suggested retail price of only $69.95 (non-Epson) or $73.95 (Epson), TYMAC gives you the best printer interface available for your money.

With "The Connection," you can execute standard print commands (OPEN, PRINT#, and CLOSE) and create finished documents and graphics to your own specifications. Various options include column tabbing, dot tabbing, graphic repeat, dot addressable graphics, and more. Full printer self-test, LED status indicator, printer reset switch, skip over perf, margin set, and programmable line length give you maximum flexibility for optimum performance. "The Connection" also features a 2K buffer. "The Connection" is compatible with any parallel printer that is equipped with a standard Centronics interface, including Star, Riteman, Smith-Corona/Epson, Panasonic, BMC-80, Mannesman Tally, Olympia/Okidata, Canon/C. Itoh, NEC/Seikosha, Gorilla Banana/and Universal.

TYMAC backs "The Connection" with an outstanding reputation in the computer field since 1973. TYMAC tests every product 100% before it leaves the factory to guarantee flawless performance and the best value for your money. Each "Connection" comes with a full, one-year warranty. For information and literature about "The Connection," write or call TYMAC today. Or contact your local computer retailer to purchase "The Connection."

TYMAC®

Established in 1973
TYMAC CONTROLS CORPORATION
127 Main Street Franklin, NJ 07416 201-827-4050

Circle 13 on Reader Service card.

Tymac is a registered trademark of Tymac Controls Corporation. Commodore, Commodore 64, Commodore 128, Plus/4, Commodore 16, and VIC 20 are registered tradmarks of Commodore Electronics Limited.

Circle 66 on Reader Service card.

FREE SHIPPING

SOFTWARE DIMENSIONS

- Free UPS ground shipping. For next day air service add $7.
- VISA & MASTERCARD
- For C.O.D.'s add 2%—minimal service charge is $3.
- Personal and company checks will delay shipping 2 weeks.
- Company and school administration purchase orders accepted upon approval.
- Prices and availabilities subject to change without notice.
- We do not guarantee machine compatibility.

COMMODORE

SPECIALS

Bank Street Writer	$21	Karateka	$18
Fast Load	$24	Superbase 64	$48

BUSINESS

Back to Basics GL	$ 66.50
Back to Basics GL, AR, AP	136.50

EDUCATION

Adventures w/Fractions	$13.96
Basket Bounce	20.96
Blazing Paddles	24.46
Charlie Brown's ABC's	20.96
Kid Stuff	14.00
Kids on Keys	18.86
Kidwriter	18.86
Loadstar Vol #5-#10	6.96
Mastertype	27.96
Rhymes & Riddles	18.86
SAT Algebra	27.96
SAT Practice Tests	13.96
SAT Vocabulary	27.96
Science	14.00
Snooper Troops	23.06
Spell	34.96
Spellagraph	27.96
Spellakazam	20.96
Spelling Bee	13.96
The Body Transparent	31.46
Word Challenger	13.96

GAMES

Cutthroats	27.96
Deadline	34.96
Donald Duck's Playground	27.96
Enchanter	27.96
Expedition Amazon	24.46
F-15 Strike Eagle	24.46
Flight Simulator II	34.96
Ghostbusters	24.46
Hard Hat Mack	24.50
Hitchhikers Guide to the Galaxy	27.96
Impossible Mission	24.46
Infidel	31.46
Kennedy Approach	24.46
Loderunner	24.46
Mickey's Space Adventure	27.96
One-on-One	28.00
Pinball Construction Set	28.00
Sorcerer	31.46
Spy Fox	28.00
Stellar 7	20.96
Suspect	31.46
Tycoon	41.96
Ultima II	41.96
Ultima III	41.96
Winnie the Pooh	27.96
Wishbringer	27.96
Witness	27.96
Zork I	27.96
Zork II	31.46
Zork III	31.46

HOME

Bank Street Writer	$34.96
Homeword	34.96
PaperClip	83.96
Printshop Graphics Library	17.46
Printshop Paper Pack	13.96
Professional Word Processor	62.96
The Home Accountant	55.96
The Print Shop	31.46

PROGRAMMING LANGUAGE

Logo	51.76
Oxford Pascal	41.96
Simon's Basic	24.46

UTILITIES

Copy II 64	27.96
Fastload	28.00
Magic Paintbrush	24.46
Picture Builder	20.96
Shapes & Fonts	14.00

IF YOU DON'T SEE THE TITLE YOU WANT, CALL US
Call Toll Free to place your order

1-800-826-2447
Calls originating outside Colorado
Western time zone may call 8 am-8 pm

1-800-222-0697
Calls originating inside Colorado
Eastern time zone may call 9 am-11 pm

7830-A North Academy Blvd., Colorado Springs, CO 80918

And still another function is

RSPRITE <return,sp#,characteristic#>

which returns the data used to create the sprite's features (i.e., color, priority or any of the parameters given in the Sprite command).

Other useful commands are BLOAD and BSAVE, which allow you to save or load sprite definitions from disk directly into the proper memory locations. This process is especially fast if you use the 1571 disk drive.

Combined with the other Basic 7.0 commands, like Do...While...Until, Begin...Bend, If...Then...Else and the many graphics commands of the C-128, you have a programming environment able to support the most dedicated graphics programmer.

The Demonstration Program

Listing 1, the Sprite Demonstration program, is an example of how easy it is to create and animate sprites on the C-128. This program uses the C-128's ability to transfer bit-mapped graphics to string variables, use them as sprites and easily detect when sprites collide.

It creates a pair of 3D dynamic sprites and places them in a setting that resembles outer space. When they touch each other, an interrupt is activated that causes the program to branch to a designated subroutine.

The sprites are made with the Circle command. Three circles are drawn, each with a slightly different set of x and y radii and a different angle of rotation. Line 100 uses the SSHAPE command to store a portion of the screen to the string variable A$(CT). Once the image is stored as a string, the screen is cleared and the next frame is drawn.

Line 120 sets the type of interrupt to be triggered (sprite-sprite) and the line to access when it is triggered. When it is activated by the collision of the two sprites, line 120 will branch to the subroutine at line 320 and change the direction, speed and color of the sprites, as well as make a little noise.

Lines 140–150 locate sprites 1 and 2 in their initial spots, using the absolute form of MOVSPR. Line 160 creates a random background of stars, each a random color. Lines 170–180 define the two sprites and turn them on with the Sprite command.

The action is contained in lines 200–290. This is a Do/While/Loop, an improved form of program looping. This tells the program: While the con-

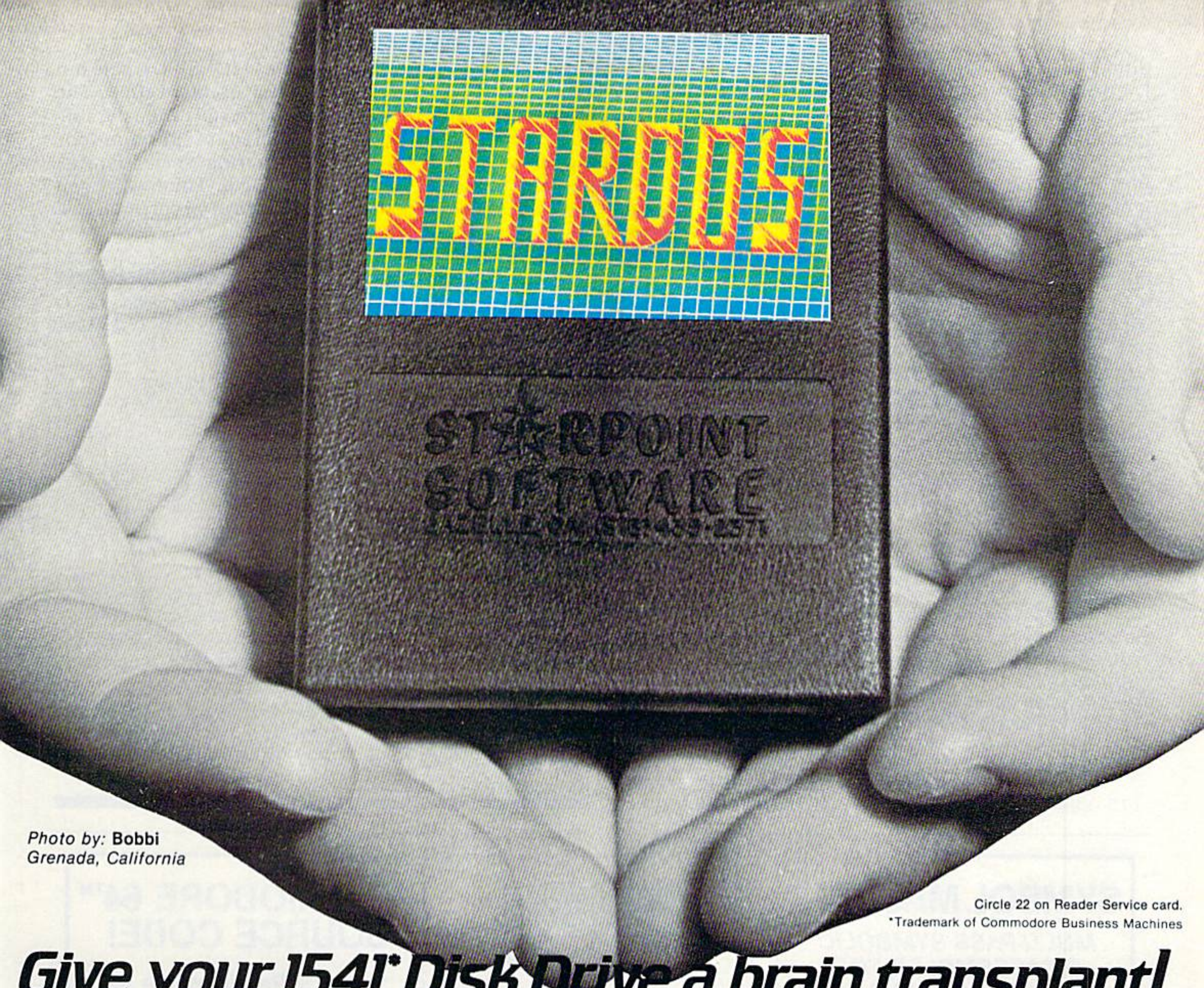


Photo by: **Bobbi**
Grenada, California

Circle 22 on Reader Service card.
*Trademark of Commodore Business Machines

Give your 1541* Disk Drive a brain transplant!

Simply plug the **STARDOS ROM** Chip into the drive unit and insert the **STARDOS** cartridge. That's all you need to do to complete a transplant procedure that will give your Disk Drive and Computer higher intelligence.

Other Quick Loaders and Fast Loaders try to 'Patch' the DOS of the Disk Drive. This does not significantly speed up much of today's Software and sometimes it fails to load altogether.

But, **STARDOS** electronically replaces the entire DOS and KERNAL. This means **STARDOS** will speed-up finding records in your Database, any changes you wish to make to your Spreadsheet and playing your favorite adventure or other Disk Intensive work with your C-64*.

The **STARDOS** transplant offers:

Speed.............. *for 'All Types' of Disk Access at an incredible 600%-1000% faster!*
Reliability....... *end overheating and "SAVE @O:" woes!*
Convenience.. *with single key load, SAVE, and Directory Etc. Built in File and Disk Copiers!*
Power.............. *full Word Processor, M.L. Monitor and Sector Editor, Screen Dumps to Printer and lots more!*
Compatibility. *STARDOS works with virtually all C-64* Software and Hardware!*
Guarantee....... *120 day repair or replacement warranty. Your satisfaction guaranteed or your money is refunded!*

The power of a Computer is a terrible thing to waste. Help your C-64* live up to its full potential...Transplant with the very best!...Transplant with **STARDOS!**

Personalize your C-64* for a $10 *(non-refundable)* charge. We will include a 21 character power-on message with your favorite screen, border and text colors. ***Example:***

■	M	I	K	E	'	S		C	O	M	M	O	D	O	R	E	-	6	4		■

Background BLACK **Border** GREEN **Text** RED

Write or phone for additional information.

STARPOINT SOFTWARE

Star Route 10 Gazelle, California 96034 (916) 435-2371

When ordering by mail:
$64.95 + 3.00 shipping
$64.95 + 4.00 COD orders

Shipping out of USA $6.00
California residents add 6% sales tax
VISA or Mastercard accepted

Please allow 4-6 weeks for delivery

dition given in line 200 (WHILE K<6.3) is true, do all the statements between it and the end of the loop (line 290).

This loop performs two important functions. First, the sprites are being moved with the automatic form of MOVSPR, which only requires an angle and speed to make the sprite move. In line 240, sprite 1 is moving at the angle SN, at a speed of 3. Sprite 2 is moving at the angle NS, at a speed of 1 (line 250). These sprites will continue to move until told to change direction or speed.

The use of the SPRSAV command is also important in this loop. In lines 270 and 280, the program stores the contents of the array variable A$(I) to the two sprites. These strings contain the circles drawn earlier, and, each time through the loop, the sprites are redefined with the different circles. The effect is one of a fluid 3-D animation inside the sprite!

Combining this with the automatic motion of the MOVSPR command gives you a great graphics effect. The SPRSAV command gives you the ability to use hundreds of sprites in your programs, creating very complex shapes and images. Think what you can do in your own programs.

Address all author correspondence to Louis R. Wallace, 6124B SW 11th Place, Gainesville, FL 32607.

Listing 1. *Sprite Demonstration program.*

```
10 Z=18:DIM A$(10)
20 COLOR 0,1:COLOR 1,6:COLOR 4,1
30 REM CREATE SPRITE ANIMATION FRAMES
40 FOR I=1 TO 180 STEP Z
50 CT=CT+1
60 GRAPHIC 1,1
70 CIRCLE 1,100,100,11,9
80 CIRCLE 1,100,100,4,7,,,180-I
90 CIRCLE 1,100,100,3,7,,,I
100 SSHAPE A$(CT),89,90,112,110
110 NEXT I
120 COLLISION1,320:REM ON IRQ GOSUB 320
130 GRAPHIC1,1
140 MOVSPR 1,89+24,90+50 :REM LOCATE
150 MOVSPR 2,189+24,90+50:REM SPRITES
160 FORI=1TO100:X=INT(RND(1)*320):Y=INT(RND
    (1)*200):C=INT(RND(1)*15)+2:COLOR1,C:DR
    AW1,X,Y:NEXT:REM MAKE STARS
170 SPRITE1,1,2,1,0,0,0:REM INITIALIZE
180 SPRITE2,1,3,1,0,0,0:REM SPRITES
190 REM START OF DO LOOP
200 DO WHILE K<6.3
210 K=K+.1
220 SN=SIN(K)*360
230 NS=COS(K)*360
240 MOVSPR1,SN#3
250 MOVSPR2,NS#1
260 I=I+1:IFI>CTTHENI=1
270 SPRSAV A$(I),1
280 SPRSAV A$(I),2
290 LOOP: REM END OF DO LOOP
300 K=0
310 GOTO200
320 SN=180-SN:MOVSPR1,SN#6
330 NS=180-NS:MOVSPR2,NS#8
340 C2=C2+1:IFC2>16THENC2=3
350 SPRITE2,,C2
360 SOUND1,65535,10,0,0,5000,2
370 RETURN
```

SYMBOL MASTER™

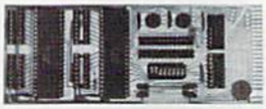
MULTI-PASS SYMBOLIC DISASSEMBLER FOR COMMODORE 64* & 128*

(Includes C-128 native 8502 mode)
disassembles any 6502/6510/8502 machine code program into beautiful source

- Learn to program like the experts!
- Adapt existing programs to your needs!
- Automatic LABEL generation.
- Outputs source code files to disk fully compatible with your MAE,* PAL,* CBM,* Develop-64,* LADS* or Merlin* assembler, ready for re-assembly and editing!
- Outputs formatted listing to screen and printer.
- Automatically uses NAMES of Kernal jump table routines and all operating system variables.
- Disassembles programs regardless of load address. Easily handles autorun "Boot" programs.
- Generates list of equates for external addresses.
- Generates complete cross-referenced symbol table.
- Recognizes instructions hidden under BIT instructions.
- 100% machine code for speed. Not copy protected.

ORDER NOW! $49.95 postpaid USA. Disk only.

*MAE is a trademark of Eastern House. PAL is a trademark of Pro-Line. Commodore 64 & 128 are trademarks and CBM is a registered trademark of Commodore. Develop-64 is a trademark of French Silk. LADS is a trademark of Compute! Publications. Merlin is a trademark of Roger Wagner Publishing.



UNLEASH THE POWER OF YOUR COMMODORE 64 WITH THE ULTIMATE INTERFACE

- Control and monitor your home—appliances, lights and security system
- Intelligently control almost any device
- Connect to Analog-to-Digital Converters
- Control Robots
- Perform automated testing
- Acquire data for laboratory and other instrumentation applications
- Many other uses

Don't make the mistake of buying a limited capability interface. Investigate our universally applicable Dual 6522 Versatile Interface Adapter (VIA) Board, which plugs into the expansion connector and provides:
Four 8-bit fully bidirectional I/O ports & eight handshake lines • Four 16 bit timer/counters • Full IRQ interrupt capability • Four convenient 16-pin DIP socket interface connections • Expandability up to four boards & sixteen ports.
ORDER NOW! Price $169, postpaid USA. Extensive documentation included. Each additional board $149.

COMMODORE 64™ SOURCE CODE!

"What's Really Inside the Commodore 64"

• Most complete available reconstructed assembly language source code for the C-64's Basic and Kernal ROMs, all 16K. • You will fully understand calls to undocumented ROM routines, and be able to effectively use them in your own programs. • Uses LABELS. Not a mere one-line disassembly. All branch targets and subroutine entry points are shown. • TABLES are fully sorted out and derived. • Completely commented, no gaps whatsoever. You will see and understand the purpose of every routine and every line of code! • Complete listing of equates to external label references. • Invaluable fully cross-referenced symbol table. Order C-64 Source. $29.95 postpaid USA.

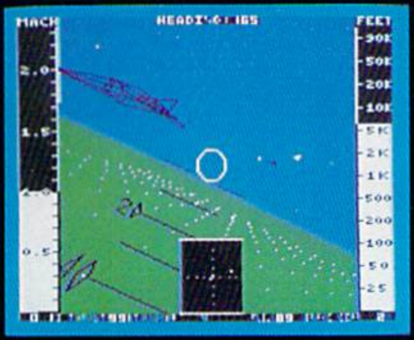
PROFESSIONAL UTILITIES:

We personally use and highly recommend these two:
- PTD6510 Symbolic Debugger for C-64. An extremely powerful tool with capabilities far beyond a machine-language monitor. $49.95 postpaid USA.
- MAE64. Fully professional macro editor/assembler. $39.95 postpaid USA.

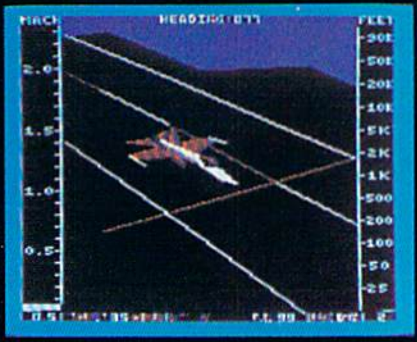
All orders shipped from stock within 24 hours via UPS. VISA/MasterCard welcomed.
There will be a delay of 15 working days on orders paid by personal check.

SCHNEDLER SYSTEMS
1501 N. Ivanhoe, Dept.R11, Arlington, VA 22205. Information/Telephone Orders (703) 237-4796

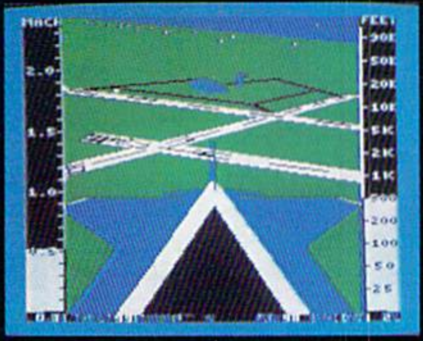
Circle 26 on Reader Service card.



F-16 Dogfight with Enemy MiG-23 Fighters



F-18 on the Deck of a Nimitz-Class Aircraft Carrier (Control Tower View)



F-16 High-G Pullout over Detailed Wargame Scenery (Rear View)

Jet

From the author of Flight Simulator II comes a new dimension in realism. Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 or a carrier-based F-18. The simulator includes modern electronic flight instrumentation and the most advanced weaponry available. Jet's simulation sophistication, combined with excellent visual attitude references, makes it truly enjoyable to fly.

Easy aircraft control coupled with ballistic thrust gives you the kind of aerobatic maneuverability only a modern jet fighter can provide. Jet's attitude indicator is easy to read no matter what your orientation. A full-screen out-the-window view helps you get the most out of Jet's excellent flight controls. And that's a major consideration when flying at speeds in excess of 1300 MPH.

With Jet you can fly through either structured or non-structured environments. Engage in a deadly variety of combat missions. Explore the wargame territory, or relax by practicing precision aerobatic maneuvers. Load in scenery from optional United States Scenery Disks. You can even load in scenery off the Flight Simulator II disk.

New high-performance graphic drivers provide beautifully detailed scenery in either day or night-flight modes. You can look forward, left, right, rearward, or straight up out of the cockpit with a single keypress. The Jet simulator even includes a special view-magnification feature that lets you zoom-in to identify objects or details at a distance.

Jet will run on any Commodore 64 or Commodore 128 computer with one disk drive and either color or monochrome monitor.

See Your Dealer ...
or write or call for more information. For direct orders please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

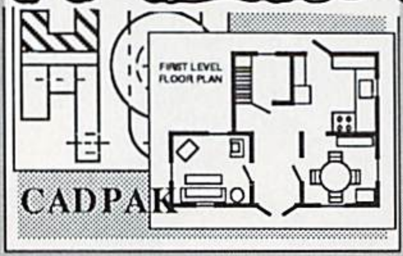
SCENERY DISKS FOR JET AND FLIGHT SIMULATOR II ARE NOW AVAILABLE.

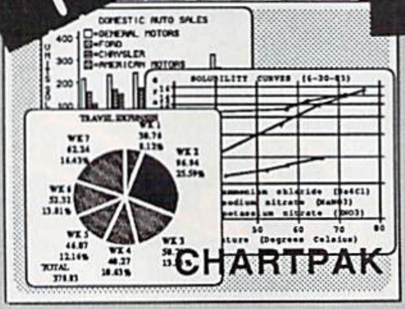
Commodore 64 and Commodore 128 are trademarks of Commodore Electronics, Ltd.

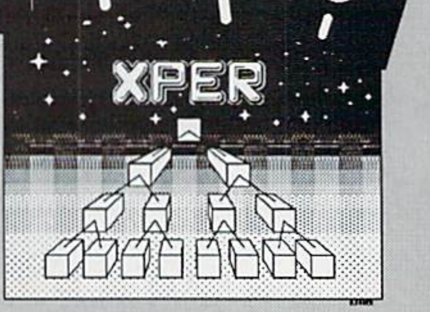
subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

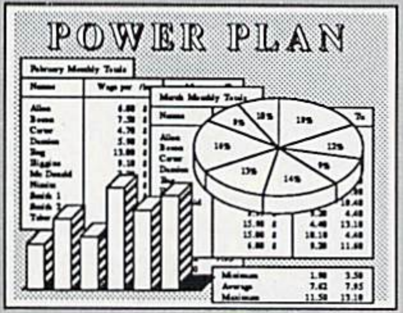
Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

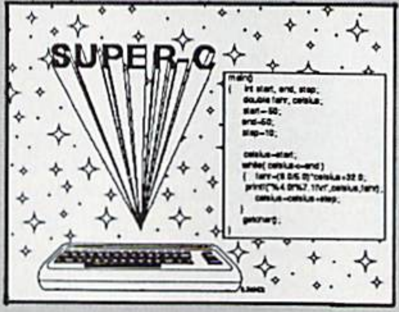
SOFTWARE HARVEST

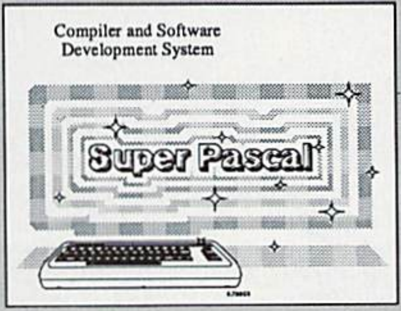

FIRST LEVEL FLOOR PLAN
CADPAK


DOMESTIC AUTO SALES
GENERAL MOTORS
FORD
CHRYSLER
AMERICAN MOTORS
TRAVEL EXPENSES
SOLUBILITY CURVES
CHARTPAK




POWER PLAN
February Monthly Totals
March Monthly Totals




Compiler and Software Development System
Super Pascal

Cadpak Enhanced Version - Graphics design and drawing package. Create detailed designs with dimensioning, scaling, text, rotating, more. Use with or without lightpen. Hardcopy. $39.95

PowerPlan - *"one of the best programs ever written for the C-64"* Commodore Magazine, Nov 1985. Complete spreadsheet with builtin graphics. Cell formatting, protection, windowing, HELP. $39.95

Chartpak - Make professional quality pie, bar and line charts/graphs directly from your data. Instantly draw or redraw charts to your specifications. Statistics capabilities. Hardcopy. $39.95

Super C - Complete **C** language development system. Enhanced full-screen editor, compiler, linker, library and extensive handbook. Used by thousands in schools and industry. $79.95

Xper - First expert system for C-128 and C-64. Ordinary data bases play back facts, but XPER's *knowledge base* help you identify, diagnosis and select - in short helps make decisions. $59.95

Super Pascal - Complete Pascal language development system. Full-screen editor, compiler, integrated assembler, graphics toolkit, fast DOS (3X faster than 1541) and handbook. $59.95

Call **now**, for the name of your nearest dealer. Or order directly from ABACUS with your Mastercard, VISA or AMEX card. Add $4.00 for postage and handling. Foreign orders add $10.00 per product. Other software and books are also available. Call or write for **free** catalog. Dealer inquiries welcome - over 1200 dealers nationwide.

Abacus Software
P.O. Box 7211 Grand Rapids, MI 49510
Tel. 616/241-5510 Telex 709-101

Circle 8 on Reader Service card.

AUTHORATATIVE, COMPREHENSIVE, DEFINITIVE

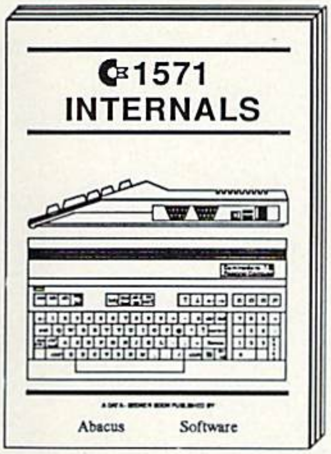
booksbooksbooks

C=-128
INTERNALS
A DATA BECKER BOOK PUBLISHED BY
Abacus Software

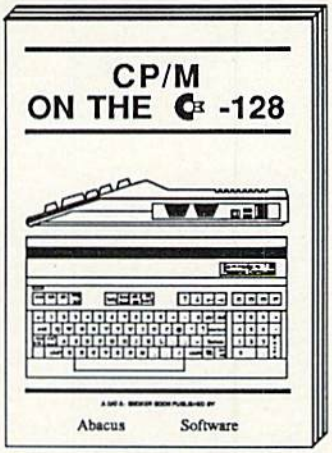
With ROM listings
Avail. Nov. $19.95

C=-128
TRICKS & TIPS
A DATA BECKER BOOK PUBLISHED BY
Abacus Software

For the programmer
Avail. Nov. $19.95

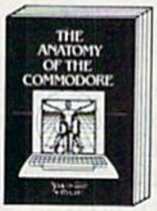

C=1571
INTERNALS
A DATA BECKER BOOK PUBLISHED BY
Abacus Software

With ROM listings
Avail. Dec. $19.95

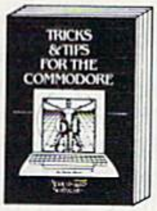

CP/M
ON THE C= -128
A DATA BECKER BOOK PUBLISHED BY
Abacus Software

Especially for the '128
Avail. Dec. $19.95

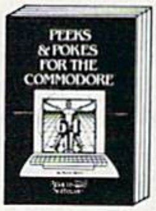
...and more books.


THE ANATOMY OF THE COMMODORE

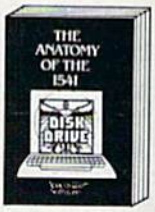
For two years a best seller. C-64 internals w/ROM listings. $19.95


TRICKS & TIPS FOR THE COMMODORE

Favorite among programmers. 75,000+ sold worldwide. $19.95


PEEKS & POKES FOR THE COMMODORE

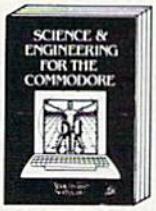
Quickhitting, easy-to-use routines for every C-64 owner. $14.95


THE ANATOMY OF THE 1541
DISK DRIVE

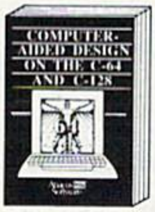
All time best seller. Revised & expanded. ROM listings. $19.95

1541 REPAIR AND MAINTENANCE HANDBOOK
DISK DRIVE

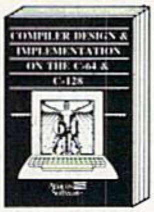
Brand new! Complete maintenance and repair procedures. $19.95


SCIENCE & ENGINEERING FOR THE COMMODORE

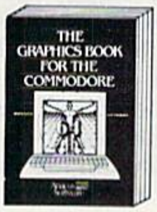
Intro to computers and world of science. Real examples. $19.95


COMPUTER-AIDED DESIGN ON THE C-64 AND C-128

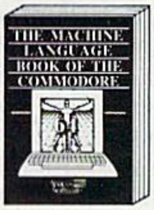
CAD techniques using C-128/C-64. Many program examples. $19.95


COMPILER DESIGN & IMPLEMENTATION ON THE C-64 & C-128

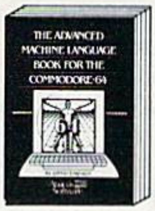
Learn to design and write your own compiler. With examples. $19.95


THE GRAPHICS BOOK FOR THE COMMODORE

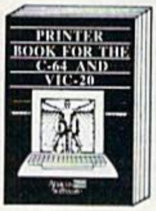
Most in depth treatment available. Dozens of techniques. $19.95


THE MACHINE LANGUAGE BOOK OF THE COMMODORE

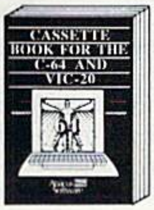
Intro to machine language geared to C-64. Assembler incl. $14.95


THE ADVANCED MACHINE LANGUAGE BOOK FOR THE COMMODORE-64

Techniques never covered before interrupts, controllers, etc. $14.95


PRINTER BOOK FOR THE C-64 AND VIC-20

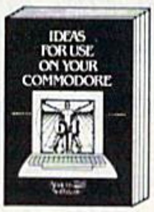
All about using printers and '64. Graphics, text, interfaces. $19.95


CASSETTE BOOK FOR THE C-64 AND VIC-20

A must for cassette owner. Hi speed cassette system. $19.95

ADVENTURE GAMEWRITERS HANDBOOK FOR COMMODORE-64

Write your own adventures. Learn strategy, motivation. $14.95


IDEAS FOR USE ON YOUR COMMODORE

Dozens of interesting pro-ects for your '64. Easy to read. $12.95

OTHER BOOKS COMING SOON!

OPTIONAL DISKETTES are also available for each of our book titles. Each diskette contains the programs found in the book to save you the time of typing them in at the keyboard. Price of each diskette is $14.95.

SAVE! Thru Nov 30th, receive the optional diskette for 1/2 price when ordered at the same time as any book. Only $7.50

Call **now**, for the name of your nearest dealer. Or order directly from ABACUS with your MC, VISA or AMEX card. Add $4.00 for postage and handling. Foreign orders add $6.00 per book. Other software and books are also available. Call or write for **free** catalog. Dealer inquiries welcome - over 1200 dealers nationwide. Call **616 / 241-5510**

Abacus Software

P.O. Box 7211 Grand Rapids, MI 49510
Phone 616/241-5510 Telex 709-101

Make a Little Music

By ARTHUR T. CHAKALIS

Make music the easy way. With your C-64 and joystick, you can create short subroutines to adorn your programs with music.

The accompanying program, Create Tunes 64, lets you easily enter sheet music to generate short musical subroutines for use in your own programs. Create Tunes 64 changes your creation into an easily manipulated Basic program.

In addition to being a programming tool, the program is a fun way to explore some of the 64's musical capabilities. Using a joystick, you may position up to 36 notes on a musical staff, with the fire-button placing or erasing notes and accessing the different program functions.

The program initially displays a title screen, then a set of instructions. At the same time, it defines the new musical note characters, loads the note data into arrays and Pokes the machine language subroutine into memory.

You will then be prompted to press the space bar. Doing so clears the screen and displays the musical staff, with your starting note at middle C. By positioning the note at various points throughout the staff and pressing the fire-button, you leave a trail of notes, thus creating your tune. At the bottom of the screen is a menu composed of letters and notes, which you'll have seen referenced in the instructions.

At this point, you are in the machine language subroutine, which reads a joystick in port 2 so you can move a note around the screen. The speed of the note's movement is variable, depending on what you want to accomplish. You can use the joystick to place your notes on the staff or to quickly access the menu. To perform a menu function, place the note on top of that function and press the fire-button.

Pressing the fire-button with the note located on the musical staff will either place or remove a note at that location. Only one note per column is permitted, so you must first erase a note you want to change before placing the new note elsewhere in that column. If you try to place two

RUN It Right

C-64; C-128 (in C-64 mode)

ED JUDICE

RITEMAN
RITEMAN C+

A classic is now in print

The **RITEMAN C+** is a dot matrix printer that's classic in its own right. For a lot of good reasons. First of all, it's built to work with Commodore* computers. This **plug-in capability** makes the rest of its features even more attractive.

It has **front-loading capability** that makes it unique in the field. Its **friction feed** will even print on a single post card. It prints the first line of every sheet so there's no more wasted paper.

It has **105 cps capability** and a **built-in stand** that lets you keep continuous-feed paper right under the **RITEMAN C+** for simple, efficient space saving. Even the ribbon lasts longer than other printers! And that's not all. There's an entire line of state-of-the-art RITEMAN classics, compatible with the IBM** and Apple*** computers.

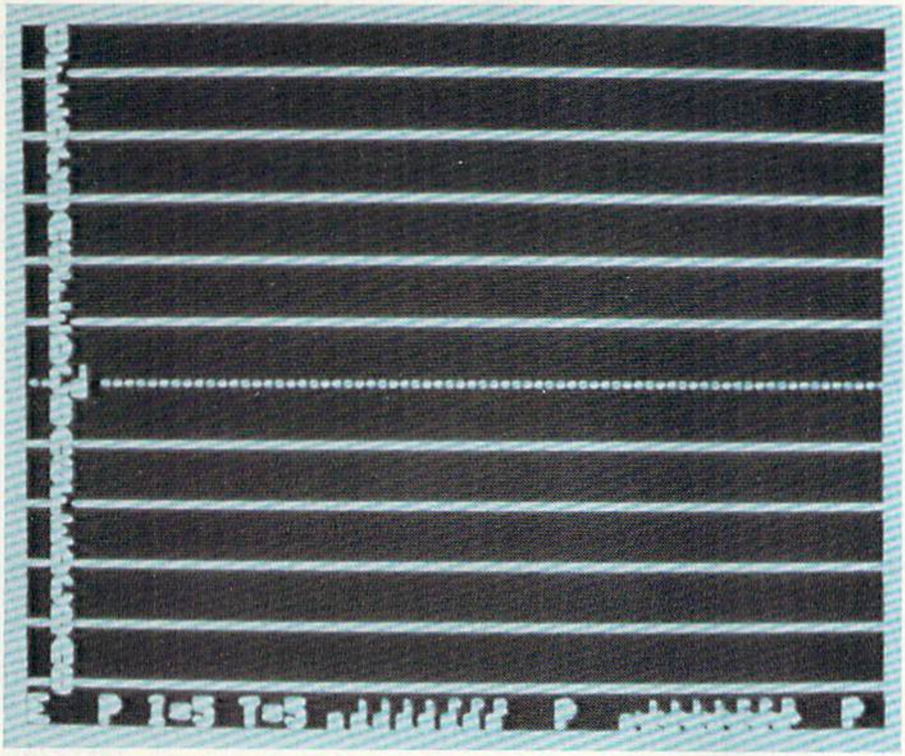
Convenience, versatility and economy—that's what makes the Riteman such a solid value.

*Commodore is a registered trademark of Commodore Electronics, Ltd.
**IBM is a registered trademark of International Business Machines, Co.
***Apple is a registered trademark of Apple Computer, Inc.

Riteman. Printers that make the right impression.

RITEMAN Division of C.ITOH
C. Itoh Digital Products, Inc. 1011 Francisco Street, Torrance, CA 90502

Circle 32 on Reader Service card.



H(36)—high-frequency bytes
L(36)—low-frequency bytes
D(36)—note duration
HN(22)—high-frequency note data
LN(22)—low-frequency note data
HS(22)—high-frequency sharp note data
LS(22)—low-frequency sharp note data
ND(16)—note duration data
SL—current screen location
FNR(SL)—calculates row (1–25)
FNC(SL)—calculates column (1–40)
R—row
C—column
OC—old character code (charcter under the note character being moved around)
NC—new character code (note character being moved around)
W—waveform
AD—attack/decay
SR—sustain/release
HP—high pulse
LP—low pulse
X—number of notes entered
I—instrument
T—tempo
V—volume
S and SA—line numbers
IC—line number increment

Table 1. *Variables and functions used in Create Tunes 64 program.*

notes in the same column, the second entry is simply ignored.

The program's menu lets you select all the note values. Whole notes through sixteenth notes are available. Naturals and sharps may be directly selected. Flats are not directly available; however, you can enter the sharp of the next lower note on the staff, as it is the same pitch as the flat you want.

Pressing the fire-button while the note is over the "P" will play the notes entered. One compromise in the program is that only the notes up to the first blank column are played, so don't leave any blank columns between notes. This was an intentional choice to avoid generating Data statements containing zeros.

The letters I and T change the tune's sound and tempo. Pressing the fire-button while the note is over the letter I changes the simulated instrument sound within a range of 1–8, each number corresponding to a different instrument.

The T functions similarly, but, rather than changing the sound, it changes the tempo at which the notes are played. T has a range of 1–9, from slow to fast.

The last function available is the letter E, which exits the Note Entry mode and lets you transform your staff music into a Basic program. When you press the fire-button over E, the screen clears and asks you for a starting line number (greater than 199) and an increment between lines.

Once you've entered your starting line number, the program prompts you for the line increment. The program then proceeds to create the new lines that will play your tune; it then deletes all of the program lines of Create Tunes 64. This takes a minute or two, due to the number of lines being added and deleted.

Once this is done, list the program and you will find only the program lines that play the tune you previously entered. Save this Basic program to tape or disk. Later, you can load and run this program alone or use it as a subroutine to append to another program.

About the Program

The program itself consists of 179 consecutively numbered lines. This was done to provide maximum freedom in the selection of line numbers for the new tune program. Should you want to modify and renumber the program, pay special attention to some of the lines after 153; these contain Goto statements in quotes that will not change automatically with a renumbering utility. For the program's variables and functions, see Table 1.

The program begins with a title-screen display and then goes to a subroutine at lines 47 through 152. This first relocates character memory to 14336 and then prints the program instructions.

Character codes 64 through 82 are then redefined, note data entered into arrays and the machine language subroutine Poked into memory. After this come the instructions for pressing the space bar, printing the note-entry screen, setting initial variables and returning to the main program.

The main logic, or control loop, begins at line 7. Control is transferred to the machine language subroutine, which reads joystick port 2 and moves the note on the screen accordingly. Pressing the fire-button exits the subroutine where character and screen location data left by the subroutine are evaluated to determine what is to be done.

Memory locations 49152–49156 serve to pass this data between the machine and Basic statements. Lines 8–40 and 153–179 evaluate and perform the various program functions. REM statements within the program listing document these functions. In brief, the logic used in this program determines where you are on the screen to see whether you're entering or editing notes or accessing a function on the bottom row.

The machine language subroutine is situated at memory locations 49168

($C010) through 49351 ($C0C7). It reads the joystick and returns to line 7 if the fire-button is pressed. If a move is read, the new location is calculated and evaluated as to whether it is within the screen boundaries set by character code 66.

If the new location is within the screen boundaries, the old character code from the present location is replaced on the screen, the character code in the new location is stored (it becomes the old character), and then the character code for the present character is placed on the screen in the new location. This process is then repeated following a delay loop that slows down execution so that the note's movement can be controlled.

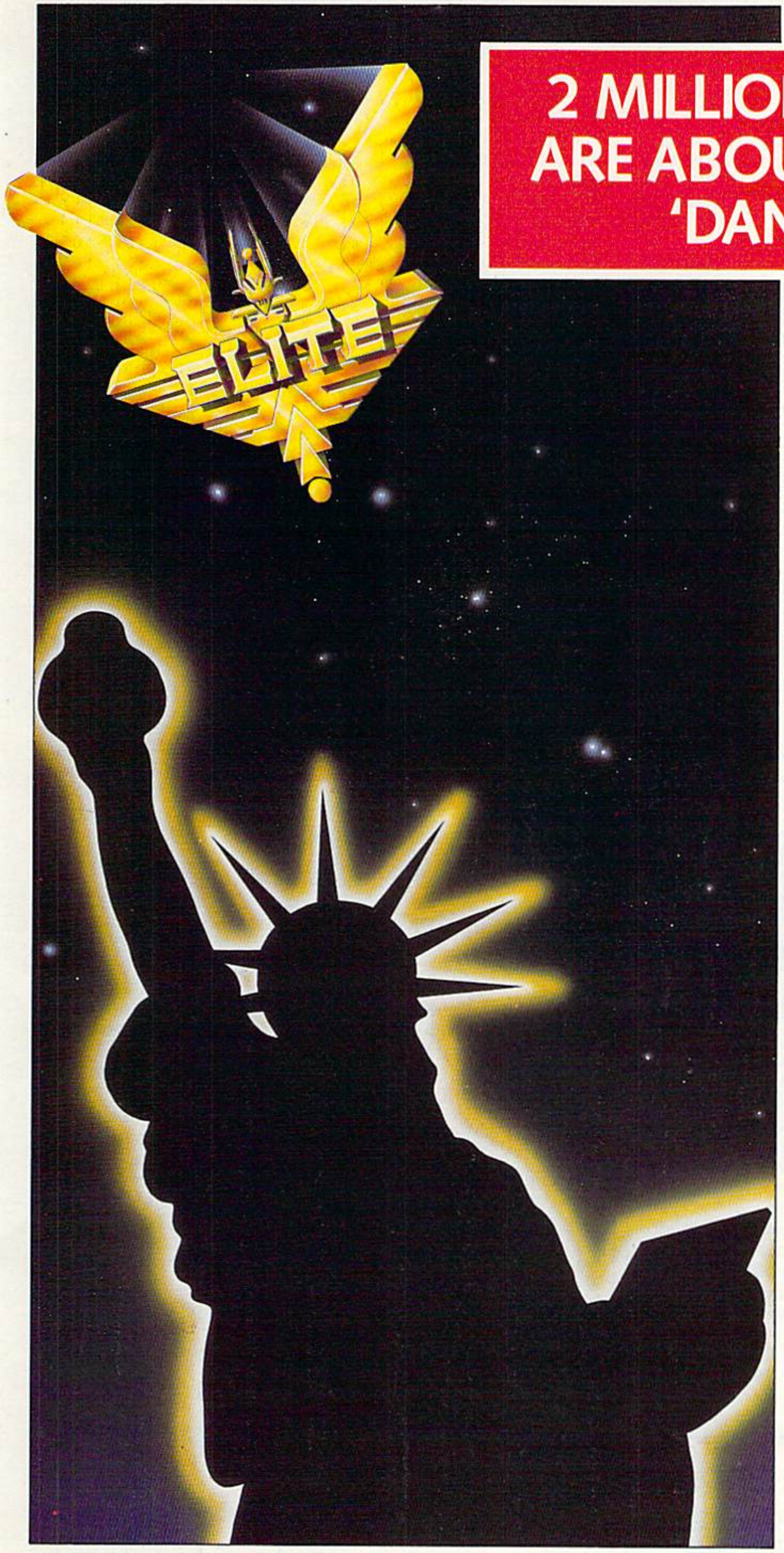
For someone learning machine language, disassembling and comprehending this simple routine would be a valuable learning experience. ®

Address all author correspondence to Arthur T. Chakalis, 494 Theori Ave., Gahanna, OH 43230.

Listing 1. *Create Tunes 64 program.*

```
1 POKE52,56:POKE56,56:CLR:PRINT"{SHFT CLR}{
  2 CRSR DNs}PLEASE{CRSR DN}{3 CRSR LFs}WAI
  T{CRSR DN}A{CRSR DN}{5 CRSR LFs}MOMENT{CR
  SR DN}{2 CRSR LFs}FOR"            :REM*195
2 FORI=1504TO1543:POKEI,3:NEXT:PRINT"{11 CR
  SR RTs}{5 CRSR DNs}CREATE TUNES 64"
                                     :REM*40
3 PRINT"{8 CRSR DNs}{2 SPACEs}BY:{3 CRSR LF
  s}{CRSR DN}ARTHUR T. CHAKALIS{CRSR DN}{6
  CRSR LFs}COPYRIGHT ,1984";        :REM*211
4 DIM H(36),L(36),D(36),HN(22),LN(22),HS(22
  ),LS(22),ND(16)                    :REM*96
5 DEF FNR(SL)=INT((SL-984)/40):DEF FNC(SL)=
  SL-(FNR(SL)*40)-983:GOSUB47        :REM*59
6 POKE49152,65:POKE49153,71:POKE49155,227:P
  OKE49156,5:POKE1507,71            :REM*196
7 REM MAIN LOOP, TO ML SUBR.& RETURN{2 SPAC
  Es}IF FIREBUTTON PRESSED          :REM*149
8 SYS49168:OC=PEEK(49152):NC=PEEK(49153)
                                    :REM*236
9 SL=(256*PEEK(49156))+PEEK(49155):R=FNR(SL
  ):C=FNC(SL)                       :REM*107
10 IFR>23THEN20:REM ROUTINES AT BOTTOM OF S
   CREEN                            :REM*248
11 IFC<4THEN8:REM OUT OF RANGE, NOTES CAN'T
    BE PLACED IN 1ST. 3 COLUMNS     :REM*229
12 IFOC<66THEN16:REM GOTO PLACE NOTE ON STA
   FF                               :REM*230
13 REM REMOVE NOTE FROM STAFF       :REM*113
14 POKE49152,PEEK((R*40)+985):POKESL,PEEK(4
   9152):H(C-3)=0:L(C-3)=0:GOSUB42 :REM*116
15 D(C-3)=0:POKESL,NC:GOTO8         :REM*183
16 IFD(C-3)<>0THEN8:REM PLACE NOTE IFA NOTE
    ISN'T ALREADY IN THE COLUMN     :REM*114
17 POKESL+54272,13:D(C-3)=ND(NC-66):POKE491
   52,NC:IFNC>74THEN19              :REM*169
18 H(C-3)=HN(R-1):L(C-3)=LN(R-1):POKESL+542
   72,11:GOTO8                      :REM*240
19 H(C-3)=HS(R-1):L(C-3)=LS(R-1):POKESL+542
   72,11:GOTO8                       :REM*15
20 IFOC>66THENPOKE49153,OC:POKESL,OC:GOTO8:
   REM CHANGE NOTE                  :REM*162
21 IFOC<>9THEN32:REM CHANGE INSTRUMENT
                                    :REM*177
22 I=1+PEEK(1952)-48:IFI>8THENI=1   :REM*152
23 IFI=1THEN W=65:AD=9:SR=0:HP=0:LP=255:GOT
   O31                              :REM*193
24 IFI=2THEN W=17:AD=96:SR=60:HP=0:LP=0:GOT
   O31                               :REM*44
25 IFI=3THEN W=33:AD=9:SR=0:HP=0:LP=0:GOTO3
   1                                 :REM*47
26 IFI=4THEN W=17:AD=9:SR=0:HP=0:LP=0:GOTO3
   1                                 :REM*92
27 IFI=5THEN W=17:AD=0:SR=240:HP=0:LP=0:GOT
   O31                              :REM*249
28 IFI=6THEN W=33:AD=0:SR=240:HP=0:LP=0:GOT
   O31                               :REM*14
29 IFI=7THEN W=17:AD=102:SR=0:HP=0:LP=0:GOT
   O31                              :REM*227
30 IFI=8THEN W=33:AD=120:SR=0:HP=0:LP=0:GOT
   O31                              :REM*248
31 POKE1952,I+48:GOTO8              :REM*249
32 IF OC<>20THEN35:REM CHANGE TEMPO :REM*88
33 T=1+PEEK(1956)-48:IFT>9THENT=1   :REM*239
34 POKE1956,T+48:GOTO8                :REM*8
35 IFOC<>16THEN 153:REM PLAY NOTES   :REM*21
36 X=0:FORI=1TO36:IFD(I)=0THEN38     :REM*48
37 X=X+1:NEXTI                      :REM*119
38 POKE54274,LP:POKE54275,HP:POKE54277,AD:P
   OKE54278,SR:POKE54296,V          :REM*154
39 FORI=1TOX:POKE54276,W:POKE54273,H(I):POK
   E54272,L(I)                      :REM*157
40 FORJ=0TOD(I)/(1.4*T):NEXTJ:POKE54276,W-1
   :NEXTI                            :REM*94
41 FORI=54272TO54300:POKEI,0:NEXTI:GOTO8
                                    :REM*201
42 S=54272: FORI=STOS+28:POKEI,0:NEXT
                                     :REM*56
43 POKE54296, 15 :POKE54277,100{2 SPACEs}:P
   OKE54278,20                      :REM*181
44 POKE54276, 33 :POKE54273, 56 :POKE54272,
    99                              :REM*130
45 FORI=1TO 25 :NEXT                :REM*199
46 FORI=STOS+28:POKEI,0:NEXT:RETURN :REM*12
47 PRINTCHR$(142):REM MOVE CHARACTER{2 SPAC
   Es}MEM. LOC.                       :REM*9
48 POKE56334,PEEK(56334)AND254      :REM*212
49 POKE1,PEEK(1)AND251              :REM*229
50 FORI=0TO511:POKEI+14336,PEEK(I+53248):NE
   XT                                :REM*46
51 POKE1,PEEK(1)OR4                  :REM*51
52 POKE56334,PEEK(56334)OR1         :REM*232
53 POKE53272,(PEEK(53272)AND240)OR14
                                    :REM*165
54 REM PRINT INSTRUCTIONS            :REM*96
55 PRINT"{SHFT CLR}{2 CRSR DNs}CREATE TUNES
    DISPLAYS A MUSICAL STAFF.{CRSR DN}"
                                    :REM*255
56 PRINT"A JOYSTICK IN PORT2 MOVES A NOTE{C
   RSR RT}AROUND. "                 :REM*226
57 PRINT"THE FIRE BUTTON PLACES/ERASES A NO
   TE ON{2 SPACEs}THE STAFF.{CRSR DN}"
                                    :REM*159
58 PRINT"THE FIREBUTTON ALSO DOES OTHER FUN
   CTIONSWHEN ON THE BOTTOM LINE."   :REM*70
59 PRINT"PRESSING IT WHILE OVER THE FOLLOWI
   NG{4 SPACEs}DOES:{CRSR DN}"       :REM*51
60 PRINT" NOTES=PICKS UP ANY NOTE SHOWN{15
   SPACEs}P=PLAY NOTES ENTERED"      :REM*74
61 PRINT"{5 SPACEs}I=CHANGE INSTRUMENT "
                                    :REM*141
62 PRINT"{5 SPACEs}T=CHANGE TEMPO"   :REM*84
63 PRINT"{5 SPACEs}E=CREATE BASIC CODE FOR
   TUNE &{12 SPACEs}DELETES ALL ELSE{CRSR D
   N}"                              :REM*147
64 REM ENTER NEW CHARACTER DEFINITIONS
                                    :REM*134
65 PRINT"PLEASE WAIT A MOMENT{CRSR UP}":FOR
   I=512TO599:READCH:POKEI+14336,CH:NEXT
                                    :REM*233
66 DATA 0,0,0,0,255,0,0,0,0,0,0,0,51,0,0,0,
   255,255,255,255,255,255,255,255 :REM*138
```

→



2 MILLION AMERICANS ARE ABOUT TO BECOME 'DANGEROUS'

You could be one.

Play **Elite** – it's totally stunning.

Elite is Britain's 1985 Adventure Game of the Year, an interstellar mind-game with incredible 3D Vector-Graphic space flight simulation

Take command of your Cobra MK III combat craft, trade with alien cultures on over 2000 planets in eight galaxies. Pick your destination on the starmap, checking out the computer's 4-way viewscan – and you're ready for your first jump thru hyperspace.

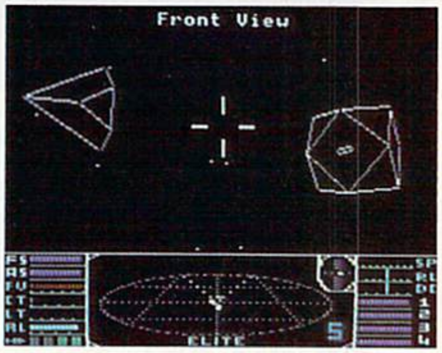
As a rookie you start with 'Harmless' status but with the right stuff and combat skills, you'll win ratings of 'Average' to 'Dangerous' – with your ultimate objective to become one of the **Elite**.

It's big, it's fast and it's here now for the **Commodore 64**™ and **128**,™ complete with Manual, Novel, Control Guide, Ship Identification Chart, Keyboard Overlay **and** the opportunity as the US competition winner to get flown to London, England to try for the Elite World Championship.

It's so addictive it's been called "the Game of a Lifetime".

Elite.

Be dangerous.



FIREBIRD

P.O. BOX 49 RAMSEY
NEW JERSEY 07446 USA.

FIREBIRD HOTLINE ☎: 201 934 7373

GOLD EDITION

Listing 1 continued.

```
67 DATA 0,0,0,0,240,144,144,240,16,16,16,16
   ,240,144,144,244,16,16,16,16,240:REM*107
68 DATA 144,144,240,16,16,16,16,240,240,240
   ,244,16,16,16,16,240,240,240,240:REM*146
69 DATA 28,16,16,16,240,240,240,244,28,16,1
   6,16,240,240,240,240              :REM*231
70 DATA 28,16,28,16,240,240,240,240:REM*144
71 FORI=536TO599:POKEI+14400,PEEK(I+14336):
   NEXT                              :REM*135
72 FORI=600TO663STEP8                :REM*210
73 POKEI+14339,((PEEK(I+14339))+2)   :REM*235
74 POKEI+14340,(PEEK(I+14340)+7)     :REM*108
75 POKEI+14341,(PEEK(I+14341)+2):NEXT
                                     :REM*123
76 REM ENTER NOTE DATA               :REM*40
77 FORI=1TO22:READ HN(I),LN(I):NEXT:REM*211
78 FORI=1TO22:READHS(I),LS(I):NEXT  :REM*58
79 FORI=1TO16:READ ND(I):NEXT        :REM*93
80 DATA25,30,22,96,21,31,18,209,16,195,15,2
   10,14,24,12,143,11,48,10,143      :REM*202
81 DATA9,104,8,97,7,233,7,12,6,71,5,152,5,7
   1,4,180,4,48                      :REM*73
82 DATA3,244,3,134,3,35              :REM*188
83 DATA26,156,23,181,0,0,19,239,17,195,0,0,
   14,239,13,78,11,218,0,0           :REM*207
84 DATA9,247,8,225,0,0,7,119,6,167,5,237,0,
   0,4,251,4,112                     :REM*142
85 DATA0,0,3,187,3,83                :REM*255
86 DATA1280,960,640,480,320,240,160,80,1280
   ,960,640,480,320,240,160,80       :REM*208
87 REM POKE ML SUBR. INTO MEM.       :REM*25
88 FOR AD= 49168TO 49351:READ DA:POKEAD,DA:
   NEXTAD                              :REM*8
89 DATA 216, 173, 0, 220, 201, 111 :REM*153
90 DATA 240, 24, 201, 126, 240, 21 :REM*230
```

Circle 84 on Reader Service card.

The Handicapper

Use your **Commodore 64** to improve your performance at the track! These fine programs for **Thoroughbreds, Harness Horses** and **Greyhounds** combine the power of your computer with the savvy of a veteran handicapper. Spend a few minutes entering data, and The Handicapper will rank the horses or dogs in each race. All the information you need is readily available from the Thoroughbred Racing Form, harness or greyhound track program. We even provide a diagram that shows you where to find it!

Horse racing factors include speed, class, past performance, post position, stretch gain, beaten favorite, jockey or driver's record, weight (for thoroughbreds) and parked-out signs (for trotters). **Greyhound factors** include speed, past performance, class, favorite box, kennel record, breaking tendencies, beaten favorite.

Instructions and wagering guide included. **Thoroughbred, Harness or Greyhound Handicapper,** only $34.95 each on tape or disk. Any two, just $54.95. All three only $74.95.

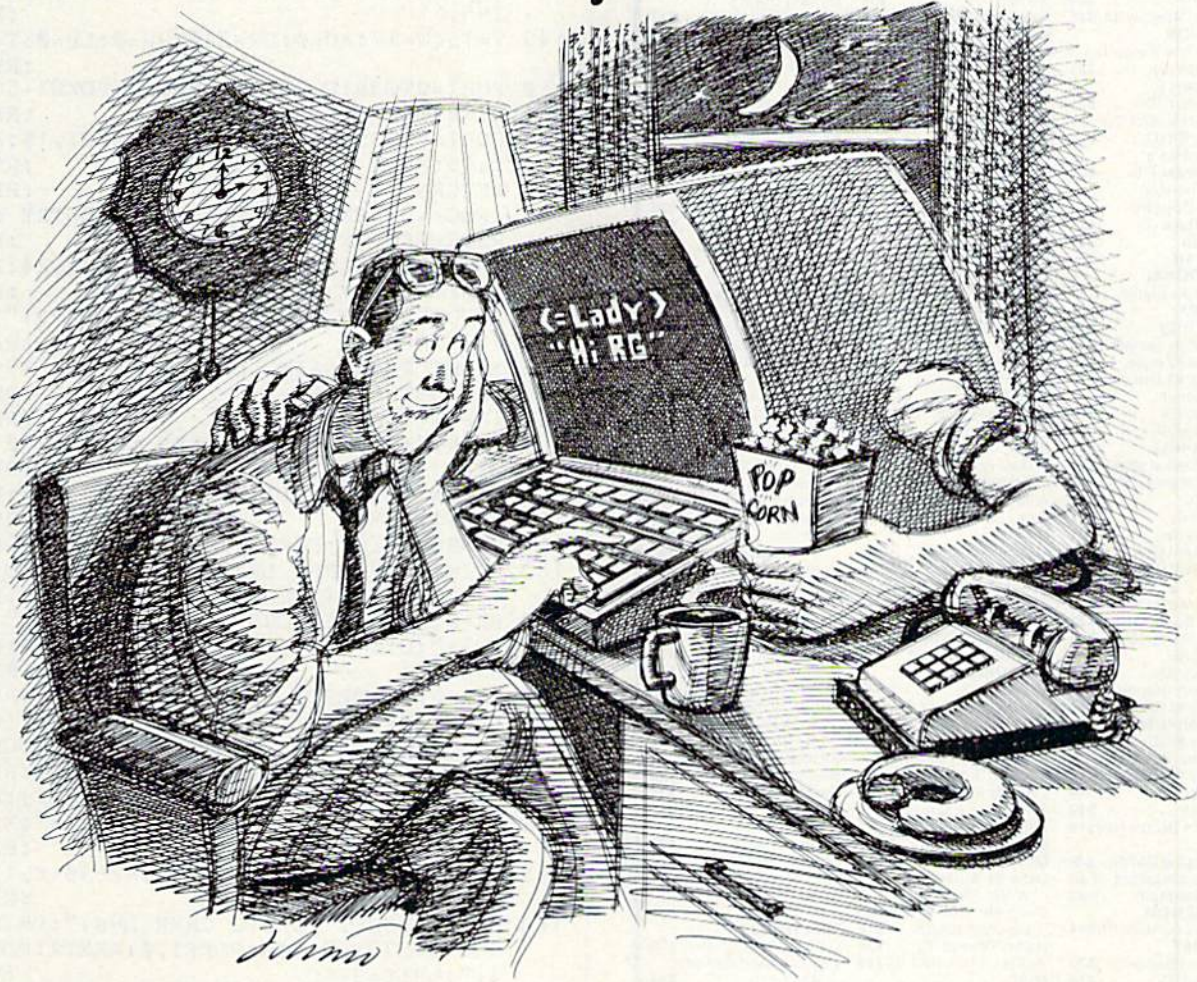
MasterCard
Federal Hill Software
8134 Scotts Level Rd.
Baltimore, MD 21208
VISA®

Toll Free (Orders Only) 800-245-6228
For Information Call 301-521-4886

```
91 DATA 201, 125, 240, 40, 201, 123 :REM*29
92 DATA 240, 54, 201, 119, 240, 68 :REM*112
93 DATA 162, 160, 142, 5, 192, 76  :REM*125
94 DATA 17, 192, 96, 56, 173, 3      :REM*6
95 DATA 192, 233, 40, 133, 251, 173  :REM*7
96 DATA 4, 192, 233, 0, 133, 252    :REM*56
97 DATA 76, 123, 192, 133, 252, 76 :REM*181
98 DATA 123, 192, 24, 173, 3, 192   :REM*60
99 DATA 105, 40, 133, 251, 173, 4   :REM*97
100 DATA 192, 105, 0, 133, 252, 76 :REM*192
101 DATA 123, 192, 56, 173, 3, 192 :REM*119
102 DATA 233, 1, 133, 251, 173, 4  :REM*114
103 DATA 192, 233, 0, 133, 252, 76  :REM*69
104 DATA 123, 192, 24, 173, 3, 192  :REM*66
105 DATA 105, 1, 133, 251, 173, 4  :REM*125
106 DATA 192, 105, 0, 133, 252, 160 :REM*30
107 DATA 0, 177, 251, 201, 66, 208 :REM*241
108 DATA 3, 76, 17, 192, 141, 2    :REM*144
109 DATA 192, 173, 3, 192, 133, 253:REM*159
110 DATA 173, 4, 192, 133, 254, 173:REM*174
111 DATA 0, 192, 145, 253, 173, 2   :REM*83
112 DATA 192, 141, 0, 192, 173, 1  :REM*138
113 DATA 192, 145, 251, 165, 251, 141
                                    :REM*27
114 DATA 3, 192, 165, 252, 141, 4   :REM*26
115 DATA 192, 173, 5, 192, 201, 32  :REM*95
116 DATA 240, 4, 56, 233, 32, 24   :REM*222
117 DATA 141, 5, 192, 170, 160, 0  :REM*159
118 DATA 136, 208, 253, 202, 208, 248
                                   :REM*156
119 DATA 24, 76, 17, 192            :REM*95
120 PRINT"PRESS SPACE BAR TO CONTINUE":GOSU
    B42                            :REM*154
121 GETA$:IFA$<>" "THEN121         :REM*213
122 REM SCREEN SETUP               :REM*208
123 POKE53280,15:POKE53281,11:PRINT"{SHFT C
    LR}":POKE53281,15:POKE646,11   :REM*245
124 PRINT"{40 SHFT Bs}";           :REM*126
125 PRINT"{SHFT B} G{36 SPACEs}{SHFT B}";
                                   :REM*135
126 PRINT"{SHFT B}{SHFT *}F{36 SHFT *s}{SHF
    T B}";                          :REM*18
127 PRINT"{SHFT B} E{36 SPACEs}{SHFT B}";
                                     :REM*9
128 PRINT"{SHFT B}{SHFT *}D{36 SHFT *s}{SHF
    T B}";                         :REM*148
129 PRINT"{SHFT B} C{36 SPACEs}{SHFT B}";
                                   :REM*137
130 PRINT"{SHFT B}{SHFT *}B{36 SHFT *s}{SHF
    T B}";                          :REM*20
131 PRINT"{SHFT B} A{36 SPACEs}{SHFT B}";
                                    :REM*11
132 PRINT"{SHFT B}{SHFT *}G{36 SHFT *s}{SHF
    T B}";                          :REM*88
133 PRINT"{SHFT B} F{36 SPACEs}{SHFT B}";
                                    :REM*79
134 PRINT"{SHFT B}{SHFT *}E{36 SHFT *s}{SHF
    T B}";                         :REM*218
135 PRINT"{SHFT B} D{36 SPACEs}{SHFT B}";
                                   :REM*209
136 PRINT"{SHFT B}{SHFT A}C{36 SHFT As}{SHF
    T B}";                           :REM*2
137 PRINT"{SHFT B} B{36 SPACEs}{SHFT B}";
                                    :REM*81
138 PRINT"{SHFT B}{SHFT *}A{36 SHFT *s}{SHF
    T B}";                         :REM*220
139 PRINT"{SHFT B} G{36 SPACEs}{SHFT B}";
                                   :REM*149
140 PRINT"{SHFT B}{SHFT *}F{36 SHFT *s}{SHF
    T B}";                          :REM*32
141 PRINT"{SHFT B} E{36 SPACEs}{SHFT B}";
                                    :REM*23
142 PRINT"{SHFT B}{SHFT *}D{36 SHFT *s}{SHF
    T B}";                         :REM*162
143 PRINT"{SHFT B} C{36 SPACEs}{SHFT B}";
                                   :REM*151
```

→

GE introduces GEnie. Your low cost way to get on-line, and stay there.*



Imagine having access to quality personal computing SIGs, software, CB simulation, E-Mail and games at 1200 baud. But paying only a 300 baud rate.

Here's GEnie™!

GEnie stands for the General Electric Network for Information Exchange. It's a part of General Electric Information Services—the world's largest commercial teleprocessing network. And now the power of GEnie is available to the home computer user.

The High Speed GEnie.

GEnie can take you to new highs in speed and keep you there. Because our non-prime time rate for 300 or 1200 baud is only $5.00* an hour. That's up to 60% less than you're paying now.

So when you're wrapped up in a computer group, or heavily into serious conversation, you can keep your eyes on the screen, not on the clock. (More good news: no minimum monthly charges, the sign up fee is just $18.00 and new subscribers get three free hours until December 31, 1985.)

What wishes Can GEnie grant?

GEnie has most everything. Including LiveWire™ CB simulator, RoundTable™ SIGs, bulletin boards, GE Mail,™ classic games like CastleQuest™ and BlackDragon,™ conference rooms, newsletters and more.

Sign up from your keyboard: 1-800-638-8369.

Just have your VISA, MasterCard or checking account number ready. Set your modem for half duplex, 300 or 1200 baud. Upon connection enter HHH then press RETURN. At the U#=prompt enter VJM11950, GEnie and press RETURN. (For additional information or assistance call 1-800-638-9636, ext. 21.)

Then get on-line with GEnie. And stay longer, for less.

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

---

*Rate applies to 300 or 1200 baud, Mon.-Fri., 6PM to 8AM local time, all day Sat., Sun. and nat'l holidays. Subject to service availability.

Circle 254 on Reader Service card.

Software Discounters of America (& Peripherals, too!)

S.D. of A

Orders Outside PA—1-800-225-7638
PA Orders — 1-800-223-7784
Customer Service 412-361-5291

Open Saturday

- Free Shipping on orders over $100 in continental USA
- No surcharge for VISA/Mastercard
- Your card is not charged until we ship

ACCESS
Beach Head 2 (D) $25
Mach 5 (R) $23
Raid Over Moscow (D) $25
ACTIVISION
Alcazar: The Forgotten Fortress (D) $21
Countdown to Shutdown (D) $21
Fast Tracks: Slot Car Const. Kit (D) $21
Gary Kitchen's Gamemaker (D) $21
Great American Cross-Country Road Race (D) $21
Hacker (D) $21
AMERICAN EDUCATIONAL
All Titles Available Call
ARTWORX
Bridge 4.0 (D) $16
Data Disk #1 female $16
Data Disk #2 male $16
Data Disk #3 female $16
International Hockey (D) $19
Strip Poker (D) $21
AVALON HILL
Jupiter Mission 1999(D) $23
Maxwell Manor (D) $19
Ripper (D) $19
Super Bowl Sunday (D) $21
Tournament Golf (D) $21
BRODERBUND
Bank St. Filer (D) $33
Bank St. Mailer (D) $33
Bank St. Speller (D) $33
Bank St. Writer (D) $33
Karateka (D) $19
Print Shop (D) $29
Print Shop Graphics Library #1 (D) $17
Print Shop Graphics Library #2 (D) $17
Print Shop Graphics Library #3 (D) $17
Spelunker (D) $19
Stealth (D) $19
Whistler's Brother (D) $19
CBS
Mastering the SAT(D) $49
Success w/Algebra Call
Success w/Math Call
CONTINENTAL
Home Accountant (D) $44
DATASOFT
Alternate Reality (D) $26
Bruce Lee (D) $19
The Goonies (D) $19
Zorro (D) $19
DAVIDSON
Math Blaster (D) $33
Word Attack (D) $33
ELECTRONIC ARTS
Adv. Const. Set(D)
Archon (D)
Archon 2: Adept (D)
Carriers at War (D)
Europe Ablaze (D)
Heart of Africa (D)
Mail Order Monsters (D)
Movie Maker (D)
Music Const. Set (D)
One-on-One (D)
Pinball Const. Set (D)
Racing Dest. Set (D)
Reach for Stars II (D)
Seven Cities Gold (D)
Skyfox (D)
Prices too low to advertise!! *Call*
EPYX
Ballblazer (D) $25
Barbie (D) $19
Fast Load (R) $25
Koronis Rift (D) $26
Rescue on Fractalus (D) $25
Summer Games II (D) $25
The Eidolon (D) $26
Winter Games (D) $25
FISHER PRICE
All Titles Available Call
GAMESTAR
On-Field Football (D) $19
Star-Rank Boxing (D) $19
HAYDEN
Sargon II (D) $16
Sargon III (D) $33
HES
HES Mon $21
Millionaire (D) $19
Omniwriter w/Spell (D) $33
Project Space Station (D) $19
Super Zaxxon (D) $12
INFOCOM
Cut Throats (D) $23
Enchanter (D) $23
Hitchhiker's Guide to the Galaxy (D) $23
Planetfall (D) $23
Wishbringer (D) $23
Zork I (D) $23
KOALA
Muppet Learning Keys (D) $39.95
Touch Tablet w/ Painter (D) $39.95
Koala Printer (D) $19
LEARNING COMPANY
All Titles Available Call
MICROLEAGUE
Baseball (D) $26
General Manager (D) $26
1984 Team Data Disk $16
MICROPROSE
Acro Jet: Advanced Flight Simulator(D) $23
Crusade in Europe (D) $26
F-15 Strike Eagle (D) $21
Kennedy Approach(D) $21
Silent Service (D) $23
MINDSCAPE
Bank St. Music Writer (D) $26
Color Me: The Computer Coloring Kit (D) $19
Halley Project (D) $26
Perfect Score SAT (D) $49
MISC.
Bounty Bob (D) $23
Buckaroo Banzai (D) $21
CSM 1541 Alignment Kit (D) $29
Central Point Copy II (D) $23
Diskey (D) $33
Fantastic Four (D) $21
Karate Champ (D) $26
Multiplan (D) Call
Spy vs. Spy (D) $19
Superbase 64 (D) $47
PROFESSIONAL SOFTWARE
Fleet System 2 (D) $47
RANDOM HOUSE
Charlie Brown's ABC'S (D) $19
Charlie Brown's 1, 2, 3'S (D) $19
SCARBOROUGH
Build A Book (D) $19
Mastertype (D) $23
Net Worth (D) $44
SIERRA
Donald Duck's Playground (D) $17
Mickey's Space Adventure (D) $17
Stunt Flyer (D) $19
Ultima II (D) $39
Winnie the Pooh (D) $17
SIMON & SCHUSTER
Kermit's Electronic Storymaker (D) $19
Spy Hunter (R) $29
Star Trek-The Kobiashi Alternative (D) $26
Typing Tutor III (D) $26
SPINNAKER
Alphabet Zoo (R) $19
Fraction Fever (R) $17
Homework Helper Call
Kids on Keys (R) $19
Kindercomp (R) $19
Story Machine (R) $17
SPRINGBOARD
Easy as ABC (D) $23
Newsroom (D) Call
Stickers (D) $23
SSI
Battalion Commander (D) $26
Breakthrough in the Ardennes (D) $39
Broadsides (D) $25
Colonial Conquest (D) $25
Computer Ambush(D) $39
Computer QB (D) $25
Field of Fire (D) $25
Gemstone Warrior (D) $23
Kampfgruppe (D) $39
Norway 1985 (D) $23
Phantasie (D) $25
Questron (D) $25
Wings of War (D) $26
SUBLOGIC
Flight Simulator II(D) $32
SYNAPSE
Brimstone (D) $26
Essex (D) $26
Mindwheel (D) $26
TELARIUM
Amazon (D) $21
Fahrenheit 451 (D) $21
Perry Mason (D) $21
Rendezvous w/Rama (D) $21
TIMEWORKS
Data Manager II (D) $33
Evelyn Wood Dynamic Reader (D) $33
Sideways (D) $19
Sylvia Porter's Personal Financial Planner(D) $39
Wordwriter w/ 85,000 Speller (D) $33
WINDHAM CLASSICS
Alice in Wonderland(D) $17
Treasure Island (D) $17
Wizard of Oz (D) $17
ACCESSORIES
Bonus SS, DD Cheap
Compuserve Starter Kit (5 hrs.) $19
Datashare Printer Int. w/Graphics $39.95
Disk Case (Holds 50) $9
Dow Jones News Retrieval Kit(5 hrs.) $16
Total Auto Answer/ Auto Dial Modem w/Software $29.95
Wicc Joysticks Call

P.O. BOX 278-DEPT. RN-WILDWOOD, PA 15091

*Ordering and Terms:** Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100.** PA residents add 6% sales tax. **AK, HI, FPO-APO**—add $5 on all orders. Sorry—no International orders. Defective merchandise will be replaced with same merchandise. Other returns subject to a 15% restocking charge—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.

Listing 1 continued.

```
144 PRINT"{SHFT B}{SHFT *}B{36 SHFT *s}{SHF
    T B}";                              :REM*34
145 PRINT"{SHFT B} A{36 SPACEs}{SHFT B}";
                                        :REM*25
146 PRINT"{SHFT B}{SHFT *}G{36 SHFT *s}{SHF
    T B}";                              :REM*102
147 PRINT"{SHFT B}E{2 SPACEs}P I=5 T=5 {SHF
    T C}{SHFT D}{SHFT E}{SHFT F}{SHFT G}{SH
    FT H}{SHFT I}{SHFT J}{2 SPACEs}P{2 SPAC
    Es}{SHFT K}{SHFT L}{SHFT M}{SHFT N}{SHF
    T O}{SHFT P}{SHFT Q}{SHFT R}{2 SPACEs}P
     {SHFT B}";                         :REM*193
148 PRINT"{39 SHFT Bs}";:POKE2023,66:POKE56
    295,11                              :REM*60
149 V=15:W=17:AD=0:SR=240:HP=0:LP=0:T=5
                                        :REM*223
150 FORI=0TO39:POKEI+55296,15:POKEI+56256,1
    5:NEXT                              :REM*224
151 FORI=55335TO56255STEP40:POKEI,15:POKEI+
    1,15:NEXT                           :REM*115
152 RETURN                              :REM*210
153 IFOC<>5THEN8:REM EXIT NOTE ENTRY & GENE
    RATE NEW PROGRAM                    :REM*23
154 POKE53272,(PEEK(53272)AND240)OR4:PRINT"
    {SHFT CLR}"                         :REM*14
155 INPUT"STARTING LINE NUMBER(<199)";S:IFS
    >199THEN157                         :REM*193
156 INPUT"TRY AGAIN, MUST BE ABOVE 199";S:I
    FS<199THEN156                       :REM*120
157 INPUT"INCREMENT";IC                 :REM*197
158 PRINT"{SHFT CLR}{2 CRSR DNs}":X=0
                                        :REM*254
159 FORI=1TO36:IFD(I)=0THEN161           :REM*89
160 X=X+1:NEXTI                         :REM*242
161 SA=S+(7*IC):FORI=1TOXSTEP4          :REM*133
162 PRINTSA;"{CRSR LF}DATA";:FORJ=0TO3:IF(I
    +J)>XTHENPRINTCHR$(20):GOTO165      :REM*62
163 PRINTH(I+J);"{CRSR LF},";L(I+J);"{CRSR
    LF},";D(I+J);"{CRSR LF},";:NEXTJ:PRINTC
    HR$(20)                             :REM*245
164 SA=SA+IC:NEXTI                      :REM*152
165 PRINT"S=";S;"{CRSR LF}:IC=";IC;"{CRSR L
    F}:LP=";LP;"{CRSR LF}:HP=";HP;"{CRSR LF
    }:AD=";AD;"{CRSR LF}:SR=";SR;       :REM*251
166 PRINT"{CRSR LF}:V=";V;"{CRSR LF}:W=";W;
    "{CRSR LF}:T=";T;"{CRSR LF}:X=";X;"{CRS
    R LF}:GOTO168"                      :REM*120
167 POKE198,10:FORK=1TO10:POKE630+K,13:NEXT
    K:PRINT"{HOME}":END                 :REM*231
168 PRINT"{SHFT CLR}{2 CRSR DNs}":PRINTS;"F
    ORI=54272TO54300:POKEI,0:NEXTI:POKE5427
    4,";LP:S=S+IC                       :REM*68
169 PRINTS;"POKE54275,";HP;"{CRSR LF}:POKE5
    4277,";AD;"{CRSR LF}:POKE54278,";SR:S=S
    +IC                                 :REM*107
170 PRINTS;"POKE54296,";V;"{CRSR LF}:W=";W;
    "{CRSR LF}:T=";T:S=S+IC             :REM*242
171 PRINTS;"FORI=1TO";X;"{CRSR LF}:READ H,L
    ,D:POKE54276,W:POKE54273,H":S=S+IC
                                        :REM*137
172 PRINTS;"POKE54272,L:FORJ=0TOD/T:NEXTJ":
    S=S+IC                              :REM*176
173 PRINTS;"POKE54276,W-1:NEXTI":S=S+IC
                                        :REM*167
174 PRINTS;"FORI=54272TO54300:POKEI,0:NEXTI
    "                                   :REM*222
175 PRINT"LN=0:GOTO177"                 :REM*107
176 POKE198,9:FORK=1TO9:POKE630+K,13:NEXTK:
    PRINT"{HOME}":END                   :REM*138
177 PRINT"{SHFT CLR}{2 CRSR DNs}":FORI=LNTO
    LN+7:PRINTI:NEXTI                   :REM*227
178 PRINT"LN=";LN+8;":IFLN<179GOTO177"
                                        :REM*106
179 POKE198,9:FORK=1TO9:POKE630+K,13:NEXTK:
    PRINT"{HOME}":END                   :REM*141
```

Circle 20 on Reader Service card.

presenting . . . CAPTURE™

A NEW WAY TO UNLOCK THE POWER OF YOUR C64 OR C128*

- **CAPTURE** IS A CARTRIDGE THAT PLUGS INTO YOUR COMPUTER'S EXPANSION PORT.
- **CAPTURE** DOES NOTHING — UNTIL YOU PRESS ITS **CAPTURE** BUTTON. UNTIL THEN, A RUNNING PROGRAM CANNOT DETECT ITS PRESENCE.
- **CAPTURE** THEN TAKES CONTROL — NO IFS, ANDS OR BUTS — AND PRESENTS A MENU.
- **CAPTURE** WILL NEATLY SAVE EVERYTHING IN YOUR COMPUTER TO YOUR 1541 OR COMPATIBLE DISK DRIVE — ALL 64K OF RAM, CPU, VIC AND SID CHIP REGISTERS — EVERYTHING. IN EASY TO VIEW CHUNKS.
- **CAPTURE** WILL, IF YOU WANT, PRE-CONFIGURE YOUR COMPUTER'S RAM SO THAT ONLY MEMORY ALTERED BY YOUR PROGRAM NEED BE SAVED.
- **CAPTURE** WILL WRITE A BOOT ON YOUR DISK SO YOU CAN RELOAD AND BEGIN EXECUTION RIGHT WHERE YOU LEFT OFF.
- **CAPTURE** DOES ALL THIS AT A COST OF JUST **$39.95**

BUT HERE'S THE BEST PART

- **CAPTURE** WILL MAKE AN AUTO-START CARTRIDGE OF YOUR PROGRAM. IT'S EASY! JUST FOLLOW THE DIRECTIONS ON THE SCREEN. NOW PLUG IN YOUR CARTRIDGE AND TURN ON YOUR COMPUTER. IN LESS THAN TWO SECONDS YOUR PROGRAM BEGINS AGAIN AT PRECISELY THE POINT WHERE YOU **CAPTURE**'D IT. MAGIC!

  BESIDES **CAPTURE**, YOU NEED A *promenade* C1 AND A SUPPLY OF CPR3 CARTRIDGE KITS.

ORDERING INFORMATION

• **CAPTURE** CARTRIDGE — COMPLETE WITH INSTRUCTIONS	$ 39.95
• *promenade* C1 — EPROM PROGRAMMER WITH DISK SOFTWARE	99.50
• CPR3 CARTRIDGE KIT — PC BOARD, CASE AND 3 EPROMS	29.95
• DR—EPROM ERASER, TWO AT A TIME, 3 TO 10 MINUTES	34.95
• STARTER SET — **CAPTURE,** *promenade* C1 AND 1 CPR3	149.95
• DELUXE SET — **CAPTURE,** *promenade* C1, DR AND 2 CPR's	199.95

SHIPPING AND HANDLING — USA: UPS SURFACE $3.00
BLUE LABEL $5.00 NEXT DAY AIR $13.00
CANADA: AIR MAIL $7.00 OTHER FOREIGN AIR $12.00

CALIFORNIA RESIDENTS ADD APPLICABLE SALES TAX
COD ORDERS, USA ONLY, ADD $3.00

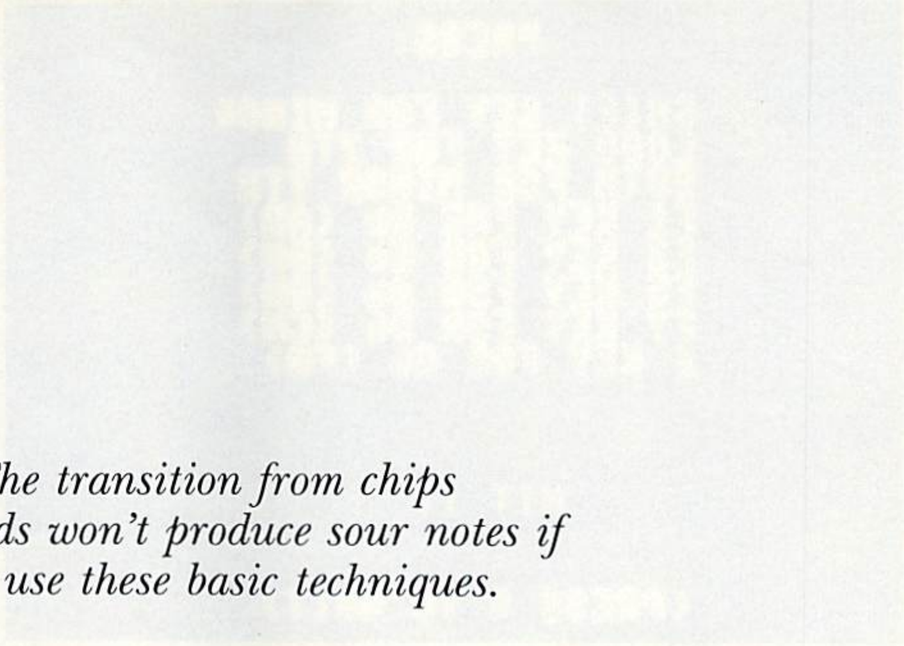
C64 AND C128 TM COMMODORE ELECTRONICS, LTD. *WHEN OPERATING IN 64 MODE

TO ORDER: TOLL FREE	800-421-7731	TECHNICAL SUPPORT AND	408-287-0259
FROM CALIFORNIA	800-421-7748	FROM OUTSIDE THE US:	408-287-0264

JASON-RANHEIM
580 PARROT STREET
SAN JOSE, CA USA 95112

VISA MasterCard AMERICAN EXPRESS

© PETER BONO 1985



The transition from chips to chords won't produce sour notes if you use these basic techniques.

Bach to Basic

By LARRY COTTON

Johann Sebastian Bach was no dummy. Some two centuries ago, he wrote what would become one of the musical classics of all time, and he did it completely without the aid of a personal computer or word processor.

Furthermore, he had the temerity to promote a little-known scheme of *tempering* the musical scale into 12 equal steps, which became the standard method of tuning musical instruments. The result of his efforts—published in 24 installments—is known as the *Well-tempered Clavier*.

Now, well-tempered doesn't mean that the clavier (the forerunner of the piano) had an even disposition—far from it; the instrument had to be tuned daily, and its strings broke with amazing regularity. What it means is that its temperament (i.e., its tuning) was even and equal. Every note's frequency had (and has) the same arithmetic relationship to its adjacent neighbor. We can prove this very quickly with the help of the Commodore 64.

The Magic Root

Take a look at *The Commodore 64 Programmer's Reference Guide*, Appendix E. If you don't have one, look at your *Commodore 64 User's Guide*, Appendix M. The two values in the right-hand column are the ones that would be Poked into memory addresses to play a particular note. Check out C-3, whose values are 8 and 97 (8 and 147 in the old user's guide). Multiply the 8 by 256, then add 97 and you get 2145, which appears in the decimal column in the reference guide.

Now look at the values for C#-3. Doing the same calculations on 8 and 225 yields 2273. What relationship does 2273 have to 2145? Furthermore, what relationship does 2408 (the next higher number) have to 2273? Give up? All right, here it is: Simply multiply the lower number by 1.05946309 to get the next higher number. Where did 1.05946309 come from? It's the twelfth root of two! Expressed so the C-64 can understand, it's 2↑(1/12).

Any root of a number may be calculated this way. A simpler example is the square root, say, of 9, which we know is 3. The C-64 has two ways of finding the square root of 9: SQR(9) and 9↑(1/2). The *cube* root of eight is 2 (2 × 2 × 2 = 8). This can be expressed 8↑(1/3). Thus the *twelfth* root of 2 is calculated as 2↑(1/12).

Try that right now with your computer in the Immediate mode. Type PRINT 2↑(1/12) and press the return key. I'm in big trouble if you don't get 1.05946309. Now take, for example, 2145 (the value for C-3) from the decimal column in Appendix E, *Commodore 64 Programmer's Reference Guide*, and type PRINT 2145*2↑(1/12). The answer could be rounded to 2273, the decimal value for C#-3.

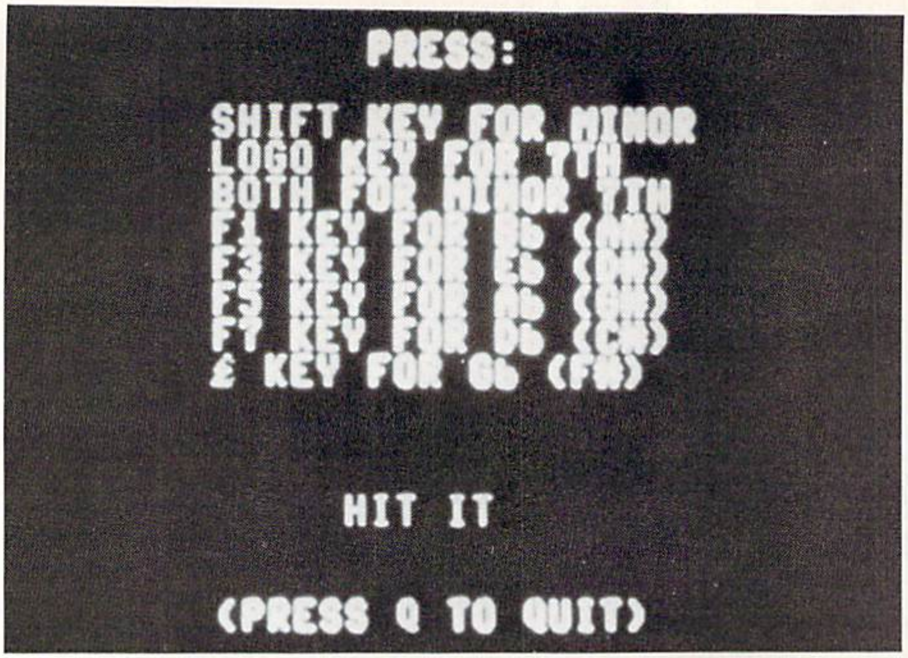
Notes on The Accompanist

In the listing, note factors F1 through F4 in lines 150–165. This is one place where the twelfth root of 2 comes in. It is used to calculate the minor 3rd, major 3rd, 5th and 7th tones, which form three-note chords when selectively heard with the root tone (lowest note).

The other place is in line 1000, which increments the lowest decimal number to correspond to the 12 steps in a well-tempered chromatic scale. Result: only one number (N) is used to calculate values for 48 three-note chords, thanks to that magic twelfth root of 2!

RUN It Right

C-64; C-128 (in C-64 mode)



PRESS:

SHIFT KEY FOR MINOR
LOGO KEY FOR 7TH
BOTH FOR MINOR 7TH
F1 KEY FOR Bb (A#)
F3 KEY FOR Eb (D#)
F5 KEY FOR Ab (G#)
F7 KEY FOR Db (C#)
£ KEY FOR Gb (F#)

HIT IT

(PRESS Q TO QUIT)

The rest of the program is fairly straightforward. Lines 5 through 70 set up the screen and sound chip for organ-like tones. Line 170 lets you change the value of N (the lowest decimal number corresponding to the lowest pitch heard) to raise or lower the overall pitch of the tones that you'll hear. Doubling N would cause everything to sound exactly one octave higher.

Lines 200–340 do our calculating. Lines 450–525 look at two very useful memory locations, 653 and 197, which contain information about the keyboard—the status of the shift, Commodore and CTRL keys (we'll use only the first two), and which key is pressed. Note especially lines 451 and 452, which detect if the run/stop key or *no* key is pressed, and line 525, which detects whether or not the Q key is pressed, to quit the program.

Lines 600 through 602 Poke in the chords' frequencies and line 610 turns on the sound.

Observe that the sound is turned off when the chord key is released, which Pokes zeroes into frequency registers, instead of the usual way of Poking a 64 into the voice registers. This avoids the release cycle of the ADSR envelope, thus speeding up response to the keyboard.

There is almost no delay between pressing a key and hearing the most-encountered chords, like C, F and G, and only a fraction of a second's delay when you want to hear the least-used chords, like E, B or D flat.

Lines 2000 to the end contain subroutines for creating silence when a key is released and for exiting the program. Unfamiliar memory addresses might be 657 and 808, which enable or disable the shift and run/stop keys, respectively, and 198, which clears the keyboard buffer for a clean screen on quitting.

How to Use the Program

Get a piece of sheet music or a do-it-yourself guitar book and run the program. When you see HIT IT! on the screen, press a key. Which key? Just above the five-line staff with the treble clef on it are chord letters like C, F, C, Bb and so on, maybe with an accompanying guitar-fingering diagram. What, no chords? Go get another piece of sheet music!

Now press the key that corresponds to the chord letter. A nice, mellow three-note sound should emanate from your television or other amplification means. What you play simulates an organist's accompaniment to a vocal or instrumental solo.

Should you encounter Bb, Eb, Ab, Db or Gb chords, use the function and £ keys, as instructed at the top of the screen. When you press only the chord (letter, function or £) keys, what you hear is the *major* chord.

Now, do an experiment. While holding down the chord key, press the shift key. The chord you hear is the corresponding *minor* chord, shown on the music as a lowercase m next to the chord letter. Again, while holding the chord key, press the Commodore key. What you hear is a three-note *seventh* chord, written in music as, say, G7. When you hold down all three (chord, shift and Commodore) keys, you'll hear, logically enough, the corresponding *minor seventh* chord, written, say, as Fm7.

Normally the screen would flicker back and forth between the two character sets when you press the Commodore key and the shift key simultaneously, but a Poke of 128 to location 657 effectively disables the shift key. (The keyboard matrix values are still found at 653.)

In the unlikely event that you encounter such chords as A#, D#, G#, C# or F#, use function and £ keys for Bb, Eb, Ab, Db and Gb, respectively. Thanks to the well-tempered scale, A# is the same as Bb, D# is the same as Eb, and so forth! Feel free to change the voices, pitch and envelopes to suit your own taste. After all, Bach would have if he'd had a C-64! R

Address all author correspondence to Larry Cotton, 3513 Canterbury Road, New Bern, NC 28560.

Listing 1. *The Accompanist program.*

```
5 POKE808,225:POKE657,128:REM DISABLE RUN/S
  TOP AND SHIFT KEYS                 :REM*175
6 POKE53281,0:POKE53280,14:PRINTCHR$(5)
                                      :REM*20
7 PRINTCHR$(147)CHR$(14):REM CLEAR HOME AND
   LOWER CASE                         :REM*93
8 PRINT:PRINT:PRINTTAB(17)"{SHFT P}{SHFT R}
   {SHFT E}{2 SHFT Ss}:"               :REM*68
10 PRINT:PRINTTAB(7)"{4 SPACEs}{CTRL 4}{SHF
   T S}{SHFT H}{SHFT I}{SHFT F}{SHFT T}{CTR
   L 2} {SHFT K}{SHFT E}{SHFT Y}{SHFT SPACE
   }{SHFT F}{SHFT O}{SHFT R} {SHFT M}{SHFT
   I}{SHFT N}{SHFT O}{SHFT R}"         :REM*42
11 PRINTTAB(7)"{4 SPACEs}{CTRL 4}{SHFT L}{S
   HFT O}{SHFT G}{SHFT O}{CTRL 2}{SHFT SPAC
   E}{SHFT K}{SHFT E}{SHFT Y}{SHFT SPACE}{S
   HFT F}{SHFT O}{SHFT R}{SHFT SPACE}7{SHFT
    T}{SHFT H}"                       :REM*149
```

→

FOR BETTER FOR WORSE

For Better: Many of our customers have paid up to twice as much and owned as many as 3 other interfaces before purchasing a PPI and becoming satisfied. So, if you plan to buy a Commodore and a printer, or if you already own a system, save yourself some time, trouble and money. Buy a PPI and get the features (that others charge up to twice as much for) at the lowest price nationwide: $49.95.

For Worse: You'll have to talk to our competitors.

Think about it.

dsi

PPI™ *with graphics buffer*

$49.95 sugg. retail

PARALLEL PRINTER INTERFACE

FOR USE WITH THE COMMODORE Vic 20, C64 and 128PC

IMPORTANT FEATURES that may not be found on other interfaces.

High Speed Graphics Buffer.
Works properly with all Commodore compatible software.
Transparent Mode Lock Controls.
Total Emulation of Commodore's Graphic, Character, and Command Set.
True Commodore Graphics.
Combining of Emulation and Transparent Modes.
No confusing DIP switches.
15 page easy to follow Users Manual.
FCC Approved.
Expanded Alpha, Numeric, and Graphic Characters.
Expanded Reverse Alpha, Numeric and Graphic Characters.
Condensed Reverse Alpha Numeric Characters.
Commodore Print Function Lock Controls.
Combining of Expanded and Condensed Print features.
Fully Shielded from end to end.

PRINTERS

Smith Corona Fast Text 80
Smith Corona DP series
Smith Corona 200*
Smith Corona 300*
Smith Corona 400*
Royal 600****
Royal 610****
Riteman
Radix
Star Gemini X & SG series
MPI SX Printer **
MPI X Printer**
Panasonic KXP
Inforunner
Star Delta
Blue Chip
Citizen
BMC
Mannesmann Tally MT160
Olympia Compact NP
Brother CE-50***
Brother CE-58***
Brother DM-40
Brother DX-5
Fujitsu
Epson

The PPI works with all Centronics compatible parallel printers that utilize standard ASCII characters and command sets in the transparent mode.
* Must have the Smith Corona Messenger Module #17376 interface.
** Special adapter cable is required.
*** Must have the Brother IF-50 interface.
**** Must have the Royal IF-600 interface.

Circle 105 on Reader Service card

Distributor and dealer programs available. Call 316-264-6118 for immediate information.

dsi T.M.
DATA SHARE, INC.
717 South Emporia - Wichita, Ks. 67211-2307 • 316-264-6118 • Telex: 650 193 4977
DSI is a major OEM and private label manufacturer. Call for complete information and quotations.

Listing 1 continued.

```
12 PRINTTAB(7)"{4 SPACEs}{CTRL 4}{SHFT B}{S
   HFT O}{SHFT T}{SHFT H}{CTRL 2}{SHFT SPAC
   E}{SHFT F}{SHFT O}{SHFT R}{SHFT SPACE}{S
   HFT M}{SHFT I}{SHFT N}{SHFT O}{SHFT R}{S
   HFT SPACE}7{SHFT T}{SHFT H}"       :REM*236
13 PRINTTAB(7)"{4 SPACEs}{CTRL 8}{SHFT F}1{
   SHFT SPACE}{SHFT K}{SHFT E}{SHFT Y}{CTRL
    2}{SHFT SPACE}{SHFT F}{SHFT O}{SHFT R}{
   SHFT SPACE}{SHFT B}B ({SHFT A}#)":REM*25
14 PRINTTAB(7)"{4 SPACEs}{CTRL 8}{SHFT F}3
   {SHFT K}{SHFT E}{SHFT Y}{CTRL 2}{SHFT SP
   ACE}{SHFT F}{SHFT O}{SHFT R}{SHFT SPACE}
   {SHFT E}B ({SHFT D}#)"             :REM*110
15 PRINTTAB(7)"{4 SPACEs}{CTRL 8}{SHFT F}5
   {SHFT K}{SHFT E}{SHFT Y}{CTRL 2}{SHFT SP
   ACE}{SHFT F}{SHFT O}{SHFT R}{SHFT SPACE}
   {SHFT A}B ({SHFT G}#)"             :REM*219
16 PRINTTAB(7)"{4 SPACEs}{CTRL 8}{SHFT F}7
   {SHFT K}{SHFT E}{SHFT Y}{CTRL 2}{SHFT SP
   ACE}{SHFT F}{SHFT O}{SHFT R}{SHFT SPACE}
   {SHFT D}B ({SHFT C}#)"             :REM*222
17 PRINTTAB(7)"{4 SPACEs}{CTRL 8}{LB.} {SHF
   T K}{SHFT E}{SHFT Y}{CTRL 2}{SHFT SPACE}
   {SHFT F}{SHFT O}{SHFT R}{SHFT SPACE}{SHF
   T G}B ({SHFT F}#)"                 :REM*111
20 FORT=1TO3:PRINT:NEXT:PRINTTAB(11)"{SHFT
   P}{SHFT L}{SHFT E}{SHFT A}{SHFT S}{SHFT
   E}{SHFT SPACE}{SHFT W}{SHFT A}{SHFT I}{S
   HFT T} 10 {SHFT S}{SHFT E}{SHFT C}."
                                      :REM*200
21 PRINT:PRINT"{2 SPACEs}{SHFT W}{SHFT H}{S
   HFT I}{SHFT L}{SHFT E}{SHFT SPACE}{SHFT
   W}{SHFT A}{SHFT I}{SHFT T}{SHFT I}{SHFT
   N}{SHFT G}, {SHFT P}{SHFT L}{SHFT E}{SHF
   T A}{SHFT S}{SHFT E}{SHFT SPACE}{SHFT T}
   {SHFT U}{SHFT R}{SHFT N}{SHFT SPACE}{SHF
   T U}{SHFT P}{SHFT SPACE}{SHFT V}{SHFT O}
   {SHFT L}{SHFT U}{SHFT M}{SHFT E}."
                                      :REM*247
22 FORU=1TO15:PRINTCHR$(145);:NEXTU:REM*106
25 FORU=1TO29:PRINTCHR$(160);:NEXTU:PRINTCH
   R$(145)                            :REM*25
30 FORL=54272TO54295:POKEL,0:NEXT:POKE54296
   ,15                                :REM*106
40 V(1)=54276:V(2)=54283:V(3)=54290:REM*104
50 VH(1)=54273:VL(1)=54272:VH(2)=54280:VL(2
   )=54279:VH(3)=54287:VL(3)=54286 :REM*212
60 POKE54277,4:POKE54278,190:REM ADSRV1
                                      :REM*90
61 POKE54284,4:POKE54285,190:REM ADSRV2
                                      :REM*167
62 POKE54291,4:POKE54292,190:REM ADSRV3
                                      :REM*242
70 POKE54275,8:POKE54282,8:POKE54289,8:REM
   50% DUTY CYCLE SQUARE WAVE         :REM*250
100 DIMA(4,12),B(4,12),C(4,12),D(4,12),E(4,
    12),F(4,12)                       :REM*194
150 F1=(2{UP ARROW}(1/12)){UP ARROW}3:REM M
    INOR THIRD                        :REM*146
155 F2=(2{UP ARROW}(1/12)){UP ARROW}4:REM M
    AJOR THIRD                        :REM*159
160 F3=(2{UP ARROW}(1/12)){UP ARROW}7:REM F
    IFTH                              :REM*210
165 F4=(2{UP ARROW}(1/12)){UP ARROW}10:REM
    SEVENTH                           :REM*81
170 N=2145:REM DECIMAL NO. FROM APP.E PROGR
    AMMER'S REFERENCE GUIDE (C-3)  :REM*104
180 K=256                             :REM*208
200 X=0:Q=N:FORY=0TO11:GOSUB300:GOSUB320:GO
    SUB330:GOSUB1000:NEXTY            :REM*48
210 X=1:Q=N:FORY=0TO11:GOSUB300:GOSUB310:GO
    SUB330:GOSUB1000:NEXTY            :REM*72
220 X=2:Q=N:FORY=0TO11:GOSUB300:GOSUB320:GO
    SUB340:GOSUB1000:NEXTY            :REM*166
230 X=3:Q=N:FORY=0TO11:GOSUB300:GOSUB310:GO
    SUB340:GOSUB1000:NEXTY            :REM*190
250 GOTO400                           :REM*204
300 A(X,Y)=INT(Q/K):B(X,Y)=INT(Q-(K*A(X,Y))
    ):RETURN:REM ROOT                 :REM*233
310 C(X,Y)=INT(Q*F1/K):D(X,Y)=INT(Q*F1-(K*C
    (X,Y))):RETURN:REM MINOR THIRD  :REM*21
320 C(X,Y)=INT(Q*F2/K):D(X,Y)=INT(Q*F2-(K*C
    (X,Y))):RETURN:REM MAJOR THIRD :REM*193
330 E(X,Y)=INT(Q*F3/K):F(X,Y)=INT(Q*F3-(K*E
    (X,Y))):RETURN:REM FIFTH          :REM*39
340 E(X,Y)=INT(Q*F4/K):F(X,Y)=INT(Q*F4-(K*E
    (X,Y))):RETURN:REM SEVENTH        :REM*189
400 FORQ=1TO12:PRINT:NEXT:PRINT"{16 SPACEs}
    {COMD 3}{SHFT H}{SHFT I}{SHFT T}{SHFT S
    PACE}{SHFT I}{SHFT T}{CTRL 2}{8 SPACEs}
    "                                 :REM*15
410 PRINT:FORU=1TO39:PRINTCHR$(160);:NEXT
                                      :REM*213
420 PRINT:PRINTTAB(11)"({SHFT P}{SHFT R}{SH
    FT E}{2 SHFT Ss} {CTRL 8}{SHFT Q}{CTRL
    2} {SHFT T}{SHFT O} {SHFT Q}{SHFT U}{SH
    FT I}{SHFT T})"                   :REM*183
430 FORU=1TO4:PRINTCHR$(145);:NEXTU:REM*165
450 U=PEEK(197):V=PEEK(653)           :REM*215
451 IFU=63THEN450:REM RUN/STOP KEY   :REM*46
452 IFU=64THEN2000:REM NO KEY        :REM*83
453 IFV=0THENX=0:PRINTTAB(19)"{SHFT M}{SHFT
     A}{SHFT J} {CRSR UP}":GOTO500   :REM*34
454 IFV=1THENX=1:PRINTTAB(19)"{SHFT M}{SHFT
     I}{SHFT N} {CRSR UP}":GOTO500 :REM*133
455 IFV=2THENX=2:PRINTTAB(19)"7{3 SPACEs}{C
    RSR UP}":GOTO500                  :REM*94
456 IFV=3THENX=3:PRINTTAB(19)"{SHFT M}{SHFT
     I}{SHFT N}7{CRSR UP}":GOTO500   :REM*61
500 IFU=20THENY=0:PRINTTAB(16)"{SHFT C}{2 S
    PACEs}{CRSR UP}":GOTO600        :REM*121
502 IFU=21THENY=5:PRINTTAB(16)"{SHFT F}{2 S
    PACEs}{CRSR UP}":GOTO600        :REM*219
504 IFU=26THENY=7:PRINTTAB(16)"{SHFT G}{2 S
    PACEs}{CRSR UP}":GOTO600         :REM*43
506 IFU=4THENY=10:PRINTTAB(16)"{SHFT B}B {C
    RSR UP}":GOTO600                  :REM*213
508 IFU=18THENY=2:PRINTTAB(16)"{SHFT D}{2 S
    PACEs}{CRSR UP}":GOTO600        :REM*111
510 IFU=5THENY=3:PRINTTAB(16)"{SHFT E}B {CR
    SR UP}":GOTO600                   :REM*77
512 IFU=10THENY=9:PRINTTAB(16)"{SHFT A}{2 S
    PACEs}{CRSR UP}":GOTO600        :REM*130
514 IFU=6THENY=8:PRINTTAB(16)"{SHFT A}B {CR
    SR UP}":GOTO600                   :REM*116
516 IFU=14THENY=4:PRINTTAB(16)"{SHFT E}{2 S
    PACEs}{CRSR UP}":GOTO600        :REM*132
518 IFU=3THENY=1:PRINTTAB(16)"{SHFT D}B {CR
    SR UP}":GOTO600                   :REM*16
520 IFU=28THENY=11:PRINTTAB(16)"{SHFT B}{2
    SPACEs}{CRSR UP}":GOTO600       :REM*234
522 IFU=48THENY=6:PRINTTAB(16)"{SHFT G}B {C
    RSR UP}":GOTO600                  :REM*10
525 IFU=62THEN3000:REM QUIT          :REM*149
530 GOTO450                           :REM*54
600 POKEVH(1),A(X,Y):POKEVL(1),B(X,Y):POKEV
    H(2),C(X,Y)                       :REM*36
602 POKEVL(2),D(X,Y):POKEVH(3),E(X,Y):POKEV
    L(3),F(X,Y)                       :REM*164
610 POKEV(1),65:POKEV(2),65:POKEV(3),65
                                      :REM*118
640 GOTO450                           :REM*164
1000 Q=INT(Q*2{UP ARROW}(1/12)):RETURN:REM
     CALCULATES NEXT HIGHER DECIMAL:REM*185
2000 POKEVH(1),0:POKEVL(1),0:POKEVH(2),0:PO
     KEVL(2),0:POKEVH(3),0:POKEVL(3),0
                                      :REM*165
2002 GOTO450                          :REM*251
3000 PRINTCHR$(147):POKE657,0:POKE808,237:P
     OKE198,0:PRINTCHR$(142):END    :REM*219
```

"KENNEDY APPROACH..."
NEW SPEAKING SIMULATION
See and Hear All the Action!
"...This is UA 236...Emergency Fuel...one zero minutes!!!..."
MicroProse Software
"KENNEDY APPROACH..."

CESSNA and MICRO PROSE
present the
Great American
LEARN TO FLY A REAL AIRPLANE
Contest

$30 OFF COUPON AND FREE FLYING LESSONS!!!

You get a coupon worth up to $30 towards a Cessna "Discovery Flight" in every flying simulation product box — Plus you can win a complete flight training course from Cessna. Details in every box, or see your local dealer.

Commodore-64 Screen Picture

Voice Communications coming in from all directions!! 20 Aircraft in the pattern, and now you have an EMERGENCY!! As "Kennedy Approach", YOU are in charge!! It's your job to get all these aircraft and passengers on the ground or on the way safely!! You'll really be glad when this shift is over!!

"Kennedy Approach" is the first "Speaking Simulation" that allows you not only to control the exciting action in the skies around some of our busiest airports but also to hear and communicate with the simulation aircraft using computer generated speech. Fast action, great aircraft control simulation, and outstanding graphics and sound make "Kennedy Approach" a must addition to your simulation software library!! **SEE YOUR LOCAL RETAILER** for "Kennedy Approach". Available for Commodore-64 and Atari computers for suggested retail of only $34.95. For more information on all MicroProse products call or write.

Experience the reality of these other great simulations from MicroProse:

F-15 STRIKE EAGLE

Solo FLIGHT

Crusade in Europe

MICRO PROSE
SIMULATION • SOFTWARE

The Action is Simulated — the Excitement is REAL!!!

120 Lakefront Drive Hunt Valley, MD. 21030
301-667-1151

Circle 103 on Reader Service card.

Commodore-64 and Atari are registered trademarks of Commodore Business Machines, Inc. and Atari Inc. respectively. Software Speech™ by Electronic Speech Systems of Berkeley, CA.

Circle 155 on Reader Service card.

Sensational Prices!
. . . On Our Most Popular Items!

The Right Interface For All Your Printing Needs!!

PPI with graphics — This high-performance graphics parallel printer interface from DSI for C-64 and VIC-20 emulates a Commodore printer. Comes complete with all necessary cables for quick installation and includes easy-to-follow user's manual.

33565 **$44.95**

G-Wiz Interface — Built-in buffer provides super high-speed printing for parallel printers. Dumps high-resolution screens up to 18 times faster. Prints all Commodore characters. All cables and connectors included. From Cardco. Lifetime warranty.

34484 **$53.95**

Cardprint + G — Top of the line parallel interface from Cardco. Full graphics capability. Prints full Commodore character set including graphics. Controls automatic line feed . . . and much more! Includes all necessary cables and connections. Lifetime guarantee.

20623 **$79.95**

Ready . . . Set . . . PRINT!
PRINTER PLUS GRAPHICS INTERFACE
ONLY $189!!

We've combined a famous name printer with an outstanding graphics interface to offer a complete printer package for your C-64 at an unbeatable value! Similar systems can cost $300 and up . . . but due to our high volume you pay ONLY $189!!

You get a standard printing speed of 100 CPS along with Near Letter Quality *and* compressed print modes available at the flip of a switch. Printing is bi-directional and logic seeking. Both friction and tractor feed are standard—handles original plus two copies.

Other features include graphics printing (compatible with almost all popular graphics software programs), programmable line spacing, and more!

Dimensions: 15.5″ W × 11″ D × 4″ H″. Weight: 10.8 lbs.

Here's another plus—the parallel, Centronics compatible printer can be used with *any* parallel output computer . . . lets the printer do double duty, or more!

90 days parts and labor warranty with a lifetime warranty on the printhead.

35044 Printer Plus Graphics Interface **$189.00**

Supply is limited — call now!

POWER and PROTECTION FOR YOUR C-64!

POW'R PAK 64

Pow'r Pak is a replacement power supply (1.5 amp) for the Commodore 64 . . . but that's not all! Pow'r Pak also supplies two additional surge protected outlets (120V) for monitor, disk drive, or other peripherals. On/off switch. Fuse protection. Sturdy all-metal casing is ventilated for heat dissipation. Full 1 year warranty.

34910 **$49.95**

star

SG-10

Lowest Price! **33251 $CALL**
Also: **34446 SG-10C** with Built-In Commodore Interface! **$CALL**

NEW

EPSON LX-90 plus Interface

Plug-in-and-Print!!

100 CPS dot matrix printer also offers Near Letter Quality printing at 16 CPS. Friction and tractor feed. No other cables or interfaces required!

35011 LX-90 Printer **$259.00**
35025 Commodore Interface **$44.95**
Also: **New FX-85 & FX-185! LX-80** **$CALL**

We stock a complete line of Star, Epson, BMC, and Axiom peripherals. Call for best prices!

The Most Complete Disk Drive You Can Buy

Includes Word Processor, Spread Sheet, and Data Base Manager

INDUS GT ONLY $229

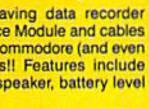
State-of-the-art disk drive for C-64 and VIC-20 features LED sector indicator, electronic write-protect, built-in wedge, and operating speeds up to 400% faster. Package includes cables and power supply, carrying case that doubles as a disk storage file AND software starter package featuring word processor, spreadsheet, and database manager program!

FULL YEAR PARTS AND LABOR WARRANTY!!

33443 Indus GT Disk Drive ONLY **$229**

NEW from GE

Computer Data Recorder



New compact, space-saving data recorder from GE includes Interface Module and cables for direct connection to Commodore (and even Atari) computer systems!! Features include digital counter, monitor speaker, battery level indicator, AC converter.

Sug. Retail $69.95
34592 ONLY **$39.95**

WHAT DO YOU GET A COMPUTER ENTHUSIAST FOR CHRISTMAS?

A Gift Certificate from TENEX Computer Express!!

Give a gift you *know* will be appreciated . . . a gift certificate and a copy of our catalog filled with computer software, hardware and accessories!

Gift certificates are available for $25, $50, $75, $100, etc. (in multiples of $25). Please specify Commodore or TI 99/4A catalog. Let us know if you would like the certificate and catalog sent to you, or directly to the gift recipient.

34981 Christmas Gift Certificate

From Your Friends At
TENEX Computer Express

We gladly accept mail orders!

P.O. Box 6578
South Bend, IN 46660

Questions? Call 219/259-7051

Ad R1K

SHIPPING CHARGES

ORDER AMOUNT	CHARGE
less than $20.00	$3.75
$20.00–$39.99	4.75
$40.00–$74.99	5.75
$75.00–$149.99	6.75
$150.00–$299.99	7.75
$300 & up	8.75

MasterCard
VISA

NO EXTRA FEE FOR CHARGES

NO HIDDEN EXTRAS

ORDER TOLL FREE
1-800-348-2778

Circle 155 on Reader Service card.

Sensational Prices!
. . . On Our Most Popular Items!

Introducing . . .

THE 79¢ DISKETTE

Are you paying too much for diskettes? Try our first quality, prime, 5¼″ diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; each box contains 5 shrink-wrapped 10-packs that include diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 **$39.50**–79¢ ea.!

DS, DD Diskettes, Box of 50
32403 **$49.50**–99¢ ea.!

LETTER QUALITY PRINTING FOR $199!!

We have made a special purchase of these high quality daisy wheel printers from a major printer manufacturer, and can offer them to you at this incredible price! All printers are brand new, and feature a full 1 year manufacturer's warranty!

Print superb letter quality type in standard, bold, subscript, superscript and underlined characters for full word-processing compatibility at 10 CPS, bidirectional. Friction feed with a tractor feed option. This much quality at such a low price is a "don't miss" bargain! *Sug. Retail $319.00*

34451 Letter Quality Printer $199.00

CARTRIDGE EXPANDER

Plus $22.95 FAST LOAD OFFER!

Stop wearing out your computer and cartridges by endless swapping! The Navarone cartridge expander features 3 cartridge slots. Select any cartridge, or the "off" position if no cartridge is to be used. Reset the computer independently of the power switch. Cartridge slots are vertical for easy access—no blind fumbling behind the computer.

33227 Cartridge Expander **$22.95**

The cartridge expander is a great companion for the Epyx Fast Load cartridge—you can keep it permanently installed plus have two slots free for other cartridges!

34216 Fast Load Cartridge (Sug. Retail $34.95) **$29.95**

Fast Load ONLY $22.95 with purchase of cartridge expander!

TIED UP BY PRINT TIME?

UBUFF™ UNIVERSAL BUFFER

U BUFF
DIGITAL DEVICES

Imagine printing a lengthy document in seconds instead of minutes . . . freeing your computer for other tasks! We were thoroughly impressed with the U Buff 64K printer buffer from Digital Devices. Just connect it between your parallel interface and your printer and it's ready for work! Its speed and versatility make it a valuable accessory for anyone with heavy printing needs.

U Buff receives print data at rates up to 4800 cps and then sends it to the printer at the printer's own print rate. With 64K of usable RAM, the buffer has enough memory to hold approximately 32 pages of data. Think of the increase in personal productivity—while the printer is still working on one document, the next one can be loaded and edited! Because the U Buff has its own power supply, it will continue to hold data even if the computer or printer is turned off, or is off line. U Buff comes complete with cables, power supply and comprehensive instruction manual. A one year limited warranty and full customer support are also included.

34888 U Buff 64K Printer Buffer **ONLY $99.95**

COMPUTERFACTS™ from SAMS

Technical Service Data for Your Computer and Peripherals

Sams introduces COMPUTERFACTS™ packets of information that reveal the inner workings of major brand micros, monitors, printers and disk drives. Includes schematic wiring diagrams, parts lists, disassembly instructions, troubleshooting techniques, and other repair data.

33477 Commodore 64 Computer	**33496** Commodore 1525 Printer
33513 VIC-20 Computer	**33508** Commodore C16 Computer
33551 Commodore Plus/4 Computer	**33546** Commodore 1701 Monitor
33481 Commodore 1541 Disk Drive	

All packets $17.95 each

Get Your Computer Talking!

THE VOICE MESSENGER SPEECH·64

This plug-in speech synthesizer from Welwyn will have your C-64 talking in no time! Add speech to your BASIC programs. . .also includes direct text to speech capability. Choose from two voices, each with intonation. Includes manual and built-in software.

34939 Save! $49.95

NEW

Command Your Computer By Voice!

Give your computer voice recognition capability with the **VOICE COMMAND MODULE** from Eng Manufacturing. The unit plugs into the C-64's RS-232 port via cable (included); a clip-on lapel microphone attaches to the module with a 6′ wire. As you speak into the microphone the machine captures a sample of the voice, compares it to a stored pre-recorded sample, and decides if it matches. Stores up to 64 different words for later recall. Package also includes a disk of software programs (includes SOS – Speech Operating System) and a user's manual. Requires disk drive. Compatible with C-128 computer.

34943 ONLY $43.95

DUST COVER and "EVERYTHING BOOK" SPECIAL OFFER

Get to know us by ordering this great dust cover for your VIC-20 or Commodore 64 and our catalog, "The Everything Book for the Commodore C-64 and VIC-20 Home Computers," for $2.95 (no extra shipping and handling charges). Cover is antistatic, translucent 8 gauge vinyl sewn to our exacting standards with reinforced seams. Discover the savings and easy shipping available from TENEX Computer Express!

$2.95

31627 Dust Cover and Catalog (R1K)

SPACE SAVING PRINTER STAND!

At last a printer stand priced for homes and small offices! This great new stand from Suncom is elevated so you can place your paper underneath.

Features heavy duty welded steel wire construction and has a vinyl coating to reduce noise and vibration. Another plus. . .the printer is held at an angle that makes it much easier to see your output as it is being printed. Available in two widths: 12″ for most 80 column printers, and 18″ for most 132 column printers.

33232	**12″ Printer Stand**	**$14.95**
33246	**18″ Printer Stand**	**$22.95**

From Your Friends At

TENEX Computer Express

We gladly accept mail orders!

P.O. Box 6578
South Bend, IN 46660

Questions? Call 219/259-7051

Ad R1K

SHIPPING CHARGES

ORDER AMOUNT	CHARGE
less than $20.00	$3.75
$20.00–$39.99	4.75
$40.00–$74.99	5.75
$75.00–$149.99	6.75
$150.00–$299.99	7.75
$300 & up	8.75

NO EXTRA FEE FOR CHARGES

NO HIDDEN EXTRAS

ORDER TOLL FREE

1-800-348-2778

Now Commodore giant leap forward

Introducing Viewtron. The new service that's easier to use, and faster to operate. At a price you may never see again.

Viewtron represents the newest, most advanced generation of on-line services. And it's less expensive to buy, less expensive to use. It's a complete service that includes information, shopping, home banking, messaging, air fares, schedules, and much more.

Viewtron is so much easier to use than other services because its sophisticated navigational structure uses everyday English keywords rather than arbitrary meaningless codes. Our system makes it faster getting around. So it saves you time. *And that saves you money.*

For instance, just type "stocks," "encyclopedia," or "news" when you want the latest stock market data, educational material, or up-to-the-minute news. You can even create your own keywords.

A single button can get you what you need.

With the touch of one button, you access a keyword file that lets you quickly review information which is particularly important to you. Like the current price of your securities, or your favorite team's stats and scores, or news in your career field.

Special services exclusively for Commodore owners.

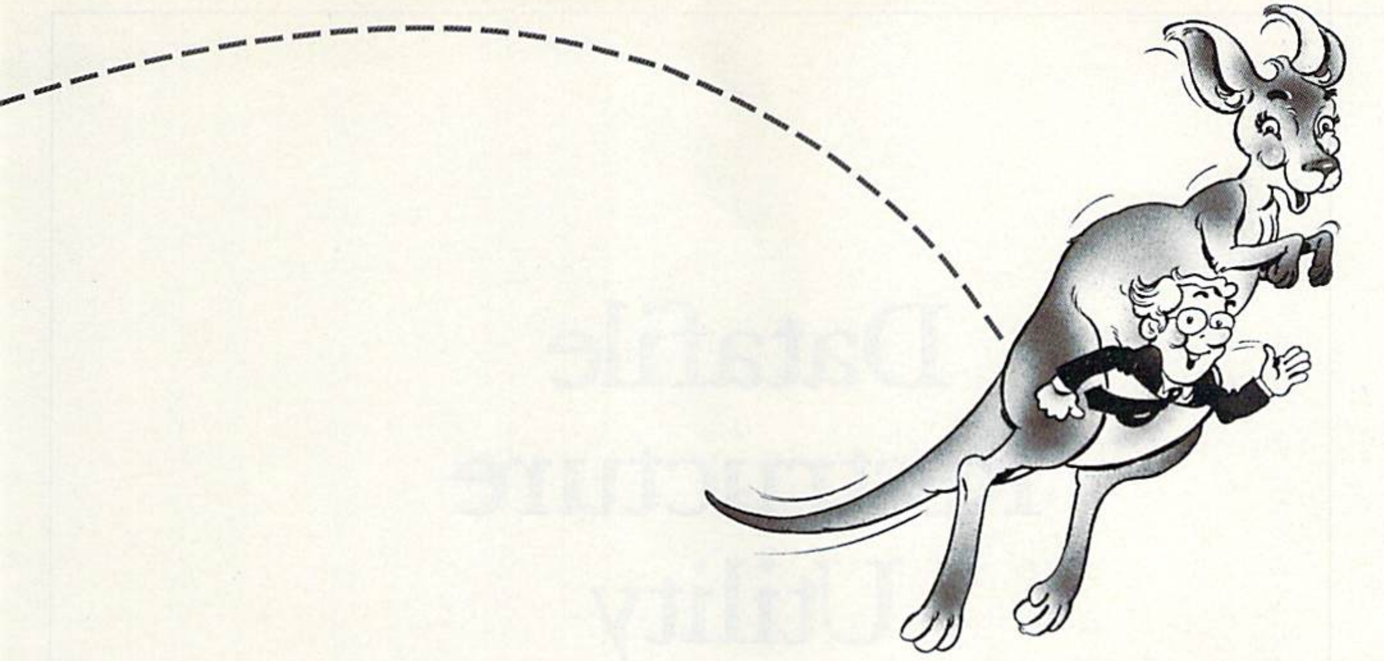
Viewtron lets you "Ask the Experts" for answers to Commodore questions. Or order bargains on hot-selling Commodore software. And you can bid on software and hardware in our electronic auction, where prices keep dropping instead of rising. Plus you get other services like Commodore software reviews. With Viewtron, you can also download free software.

What's more, Viewtron is the only complete on-line service that *runs in color* on Commodore machines.

Pay only for what you use.

Viewtron charges no subscription fee and no monthly minimum. You pay only for what you use. Just 9 cents a minute weekday nights (after 6 pm) and weekends; 22 cents a minute weekdays.* And unlike other services, we don't charge extra if you use a 1200-baud modem.

You can access Viewtron on any of three communications networks, UNINET,® GTE Telenet,® or TYMNET.® (A local call for most people.)



owners can take a in on-line services.

Limited trial offer!

FREE HOUR of Viewtron when you buy a Starter Kit at low introductory price. Only $9.95.

Just mail the coupon or call. You'll get a free hour of Viewtron.** Plus communications software and an easy-to-understand user's guide. Just $9.95. With money back guarantee.

If you need a modem – rejoice! Get Viewtron and a modem for just $49.95. (A $109 value.)

An unbeatable deal. An unbelievably low price for a modem, and the software is free. Get Viewtron, plus a 300-baud Westridge 6420 by Anchor Automation. The modem plugs into your Commodore and amazingly enough at this low price it has Auto-Dial and Auto-Answer. Satisfaction guaranteed. Order now.

LEAP ON THIS DEAL WHILE YOU CAN.

Call 1 (800) 543-5500. Dept. 9000. Or mail coupon:

Viewdata Corporation of America, Inc., Dept. 9000, P.O. Box 317678, Cincinnati, Ohio 45231.

NAME ______ ADDRESS ______

CITY/STATE/ZIP ______ PHONE NUMBER (   )

Credit cards only; sorry, no checks. Charge to: ☐ MasterCard ☐ VISA ☐ American Express

Card Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Expiration Date ☐☐ ☐☐

SIGNATURE: ______

Yes, send me one of the Viewtron offers checked below.

VIEWTRON STARTER KIT

☐ for my Commodore 64 or 128. Only $9.95.

MODEM PACKAGES FOR COMMODORE 64 or 128

☐ 300 Baud Westridge 6420 by Anchor Automation with FREE Viewtron Starter Kit. Only $49.95.

☐ 1200 Baud Volksmodem 12 by Anchor Automation with FREE Viewtron Starter Kit. Only $189.95.

SATISFACTION GUARANTEED or your money back. All modem offers include a cable (where necessary) to connect the modem to your computer. If for any reason you are not satisfied, send back the merchandise within 30 days to receive a full refund. Sorry, no C.O.D.'s. Allow four weeks for delivery. Shipping included. Florida, Illinois and New York residents will have the appropriate sales tax added to their order.

Viewtron®

A leap forward in on-line services.

To order, mail the coupon or call 24 hours a day, 7 days a week, 1 (800) 543-5500. Ask for Dept. 9000. Satisfaction Guaranteed.

Viewtron® is a service of Viewdata Corporation of America, Inc., which is a wholly-owned subsidiary of Knight-Ridder Newspapers, Inc., one of America's largest communications companies. Commodore 64™ is a trademark of Commodore Electronics, Ltd.

*Viewtron is not available in all cities. Prices may vary in some cities.

**Your free hour is available weekdays after 6 pm and weekends.

Circle 45 on Reader Service card.

Datafile Restructure Utility

By MIKE KONSHAK

Once you enter numerous records and create a file with Datafile (*RUN*, November and December 1984), you might discover that you've created a database that does not do the job you intended. Perhaps you acquired new information that doesn't quite fit the original structure, or maybe you no longer deem certain information to be necessary. It's never any fun (and it's definitely a time-waster) when you have to reenter all your data into a new file with a more suitable structure.

The Datafile Restructure program, hereafter called DFRestructure, will solve this problem by allowing you to safely change the structure of existing files created by Datafile and to save the new file under the same or a different name.

The following operations are possible with DFRestructure:

- Change the name or title of a field.
- Change the length of a field.
- Add an additional field.
- Delete an existing field.

Since Datafile is a memory-based, rather than a disk-based, system, storing the records on disk in sequential files, you can alter the field structure—add or delete fields—without destroying all your data.

> *After typing in, say, 35 records, you suddenly realize you forgot to enter an important field. Don't worry. Now you can add, delete or change fields without having to begin from scratch.*

The number of records that may be held in memory after the creation of a file is dependent on the size and number of the fields within a record. Consequently, when you change the datafile structure (except for a field name change), the number of possible records will be altered. The operations that affect the number of possible records are as follows:

- Changing the length of a field—Increasing a field's length or the number of characters within it will decrease the number of possible records. Decreasing the length will increase the number.
- Adding a new field to the structure—This obviously increases the size of each record, since an additional number of characters must be allocated for the new field. This results in less space available for records in memory. However, if you need additional information that is not specified in other fields, this sacrifice of space may be necessary.
- Deleting an existing field—This frees up more memory space, because each record is reduced by the number of characters found in the deleted field. You might choose this feature to eradicate a field you no longer consider important.

Before DFRestructure makes any changes to your datafile, it will recalculate the number of possible records based upon your selection. You will always be given the chance to change your mind before the restructured file is saved to the disk. If the file with the new structure is given a new name, then the original file will be untouched. If the original name is chosen, then the original file will be renamed with !OLD at the end of the filename. This allows you one more chance to recapture that particular datafile and structure.

The restructuring actually occurs during the writing, or saving, of the new file to the disk. As the program reads the structure information, the

RUN It Right

C-64; C-128 (in C-64 mode)
Disk drive

Circle 41 on Reader Service card.

"Shhhh, don't tell Dad I got him more BOWATER PAPER & FILES for Christmas. Mom says Bowater's helping our family get organized. That's suppose to help Dad have more time for me . . . and it helps Mom smile cause Dad doesn't have papers all over the house anymore."

Ben Wismer

Precocious 5 year old

To: DAD
BOWATER

Ben's Mom also bought Bowater's 500 sheet package of computer paper with a FREE Christmas Window Ornament that looks like stain glass. She knows Bowater gives her family ***MORE*** than just computer paper.

Ask for Bowater Computer Forms at your local office supply, computer dealer, discount or specialty department store. Or, call us and we'll help you locate the Bowater dealer nearest you.

Bowater *Paper & Files* come in 500, 1000, and 2900 sheet packages in 9½x11 - 20# bond computer paper.

Bowater *Better Image* brand with Christmas Window Ornament comes in 500 and 1000 sheet packages of 9½x11 20# bond computer paper.

BOWATER
FREE
Christmas
Window Decoration
Peace

BOWATER

BOWATER COMPUTER FORMS INC.

800/527-3412 outside Texas • 214/578-2000
P. O. Box 869020 • Plano, TX 75086-9020

drive will operate at various times throughout the procedure.

Only one of the four options may be performed at a time, with the modifications being saved to the disk after each process. If the same file is used throughout the operations, you won't have to restart the program. You must start at the beginning if you wish to modify a different file.

The DFRestructure program is really very straightforward and self-explanatory. It uses many prompts and describes the operations when necessary. The structure of the datafile will always be displayed before and after modifications are made, so you'll see the result. If you really want to be cautious, save the new datafile structure on a disk separate from the original. This will further protect your originals.

You may view the final results of your efforts by loading Datafile and reading your new restructured file. It is at this time that you might consider entering the Modify All Records option (if you added an additional field) in order to enter the data that prompted the change.

Note: If the new data you must enter is repetitious (e.g., date, country, zip code, etc.), use the new feature introduced in Datafile 3.1.

Let me explain. If the previously entered record contains the same data in the field you're currently adding or modifying, you may automatically transfer (or clone) that data into the current field by entering the equals sign (=). In other words, the current record field equals the previous record field. When you view the records, you'll see that the transfer was made. This saves considerable typing time.

If you don't want to type in the listings, send me $8 and ask for the "utility disk," which includes DFRestructure, DFCalc and several other programs. R

Address all author correspondence to Mike Konshak, 4821 Harvest Court, Colorado Springs, CO 80917.

Listing 1. *DFRestructure program.*

```
4600 REM{2 SPACEs}DATAFILE UTILITY PROGRAM
     DFRESTRUCTURE (C)1985 BY MIKE KONSHAK
                                  :REM*169
4602 POKE53280,7:POKE53281,0:PRINT"{CTRL 8}
     ":GOTO4620                     :REM*1
4604 REM--GET                     :REM*235
4606 GETA$:IFA$=""THEN4606        :REM*171
4608 RETURN                        :REM*76
4610 REM--DISK ERROR                :REM*2
4612 INPUT#15,EN,EM$,ET,ES:IF(EN<20)OR(EN=6
     2)THENET=0:RETURN            :REM*188
4614 PRINT"{CRSR DN} {CTRL 9}{COMD 3}DISK E
     RROR{CTRL 0}"EN"{CRSR LF}, "EM$","ET"{
     CRSR LF},"ES"{CTRL 8}":ET=8   :REM*230
4616 PRINT"{CRSR DN} PRESS {CTRL 9}ANY KEY{
     CTRL 0} TO RETURN TO MENU":GOSUB4606:C
     LOSE5:CLOSE15:RETURN         :REM*198
4618 REM----START MENU            :REM*174
4620 CLR:PRINT"{SHFT CLR} {CTRL 9}{5 SPACEs
     }DATAFILE RESTRUCTURE PROGRAM{5 SPACEs
     }"                            :REM*78
4622 PRINT"{CRSR DN} THIS PROGRAM WILL ALTE
     R THE STRUCTURE"              :REM*90
4624 PRINT" OF A SEQUENTIAL RECORD FILE CRE
     ATED BY"                     :REM*126
4626 PRINT" THE {CTRL 9}DATAFILE{CTRL 0} DA
     TABASE MANAGEMENT"            :REM*26
4628 PRINT" SYSTEM, WRITTEN BY MIKE KONSHAK
     ."                           :REM*226
4630 PRINT"{CRSR DN} THE FOLLOWING OPTIONS
     ARE POSSIBLE:"               :REM*120
4632 PRINT"{CRSR DN}{3 SPACEs}*{2 SPACEs}CH
     ANGE THE NAME OF A FIELD"    :REM*208
4634 PRINT"{3 SPACEs}*{2 SPACEs}CHANGE THE
     LENGTH OF A FIELD"            :REM*44
4636 PRINT"{3 SPACEs}*{2 SPACEs}ADD A FIELD
     "                             :REM*26
4638 PRINT"{3 SPACEs}*{2 SPACEs}DELETE A FI
     ELD "                        :REM*182
4640 PRINT"{CRSR DN} OPTION 2 WILL INCREASE
      OR DECREASE"                 :REM*14
4642 PRINT" THE TOTAL NUMBER OF RECORDS IN
     A FILE."                     :REM*114
4644 PRINT" OPTION 3 WILL DECREASE THE NUMB
     ER OF"                       :REM*240
4646 PRINT" RECORDS AND SOME EXISTING RECOR
     DS MAY"                      :REM*178
4648 PRINT" BE LOST.{2 SPACEs}OPTION 4 WILL
      INCREASE THE"               :REM*228
4650 PRINT" TOTAL NUMBER OF RECORDS, ELIMIN
     ATING"                       :REM*124
4652 PRINT" THE DATA FOUND IN THE CHOSEN FI
     ELD."                        :REM*154
4654 PRINT"{2 CRSR DNs} PRESS {CTRL 9}C{CTR
     L 0}ONTINUE, {CTRL 9}${CTRL 0} DIRECTO
     RY OR {CTRL 9}Q{CTRL 0}UIT"  :REM*154
4656 GOSUB4606:IFA$="Q"THENEND    :REM*140
4658 IFA$="$"THENGOSUB4896:GOTO4620:REM*176
4660 IFA$<>"C"THEN4656             :REM*20
4662 REM----OPEN FILE - READ STRUCTURE
                                  :REM*210
4664 PRINT"{SHFT CLR} {CTRL 9}{7 SPACEs}CHA
     NGE DATAFILE STRUCTURE{6 SPACEs}{CTRL
     0}"                          :REM*178
4666 PRINT"{CRSR DN} INSERT A DISK CONTAINI
     NG THE DATAFILE"              :REM*84
4668 PRINT" FILE TO BE RESTRUCTURED. PRESS
     {CTRL 9}RETURN{CTRL 0}"        :REM*0
4670 PRINT" WITHOUT AN ENTRY TO EXIT."
                                  :REM*228
4672 INPUT"{CRSR DN} NAME OF DATAFILE ";NF$
     :IFNF$=""THEN4654            :REM*210
4674 OPEN15,8,15:OPEN5,8,5,"0:DF] "+NF$+",S
     ,R":GOSUB4612:IFET=8THEN4654  :REM*226
4676 IFEN=62THENGOSUB4614:GOTO4654 :REM*216
4678 INPUT#5,R,F,X:GOSUB4612:IFET=8THEN4654
                                  :REM*162
4680 DIM F$(F+2),L%(F+2),REC$(X+1,F+2),K%(X
     +1)                           :REM*78
4682 FORN=1TOF:INPUT#5,F$(N),L%(N):NEXTN:GO
     SUB4612:IFET=8THEN4654        :REM*46
4684 CLOSE5:CLOSE15:GOTO4710       :REM*26
4686 REM----PRINT FIELD INFO FOR REFERENCE
                                   :REM*32
4688 PRINT"{SHFT CLR} {CTRL 9}FIELD NAME(LE
     NGTH) FOR {CTRL 2}"+NF$+"{CTRL 8}"
                                   :REM*72
4690 OE=1:IF(F/2)=INT(F/2)THENOE=0 :REM*204
4692 OF=INT(F/2):FORI=1TOOF+OE     :REM*66
4694 PRINT" {CTRL 9}"I"{CTRL 0}"F$(I)L%(I);
                                  :REM*250
4696 IFOE=1THEN4700               :REM*192
4698 PRINTTAB(19)"{CTRL 9}"I+OF"{CTRL 0}"F$
     (I+OF)L%(I+OF):GOTO4702       :REM*48
4700 IFI+OF<FTHENPRINTTAB(19)"{CTRL 9}"I+OF
     +1"{CTRL 0}"F$(I+OF+1)L%(I+OF+1)
                                   :REM*14
4702 NEXTI:PRINT                  :REM*156
4704 PRINTR"RECORDS ARE POSSIBLE IN FILE"
                                   :REM*98
```

→

Circle 61 on Reader Service card.

Aquarian Software Introduces . . .

Powerful Programs at Affordable Prices

Mike J. Henry's

FAST BOOT!

- Works with **Both** 1541 and MSD Drives!
- Multiple loading options for increased compatibility.
- Disk-Based & Non-Protected

Only $14.95

Graphic Screen Exporter 64

- A Universal Graphic Converter
- Converts Anything to Anything — Including:
  - Koala Pad
  - Flexidraw
  - Doodle
  - Print Shop
  - And Many More!

NEW!

- Complete On-Screen Editor

The Most Versatile Graphics Utility Ever Released for the Commodore 64 !

Only $29.95

The Cataloger

The Ultimate Disk Cataloging System for the 64!

Features of The Cataloger V3.5A Include:

- ★ Easy loading of information. Loads directly from the disk itself.
- ★ Ability to change name of entry.
- ★ Ability to change any information instantly — uses relative files exclusively.
- ★ Search, Sort and Print by any of 12 fields.
- ★ Capacity for 1100 different programs (or disks) per data disk.
- ★ FAST — all machine language.
- ★ Menu driven — very easy to use.
- ★ Works with ALL printers.
- ★ Works with one or two drives.
- ★ Allows duplicate ID's.
- ★ Allows selection of items to be entered.

Only $24.95

I.E.A.
Instant Editor Assembler

for the Commodore 64

- ★ Written 100% in machine language
- ★ Assembles 17K source code in 5 seconds!
- ★ Co-resident editor assembler monitor
- ★ Compatible with HES MON
- ★ Slow-motion code analyzer
- ★ Technical assistance number

"I would have to recommend the IEA Instant Editor Assembler, the BEST VALUE-FOR-PRICE development package on the market!"

Jim Gracely,
Technical Editor
Commodore Microcomputer Magazine

"IEA is a nice, simple assembler, good for beginners at an UNBELIEVABLE PRICE!"

Jim Butterfield

Now Only $17.95

Nova Decoder 64

Version 3.0

A 6502/6510 Disassembler Designed for the Commodore User

A MUST for anyone just learning Machine Language.
A TREAT for those examining the operation of the C-64.
A BLESSING to machine language programmers trying to de-bug their programs.

- ★ Choose Screen or Printer Options
- ★ Addresses Printed in Either Hex or Decimal
- ★ Complete Calculations of Branch Commands
- ★ Brief Explanations of Each Command Encountered
- ★ Generates Tables of Zero Page Addresses Used, Branch Addresses, All Jump Routines, and More . . .

Only $19.95

Canadian Best-Sellers NOW Available in the U.S.

The Gold Disk Series

Quality Software for Your 64 at an Affordable Price!

Only $14.95 Per Disk*

* Plus Shipping and Handling

Each Disk Contains:

- The Feature Program
- A Home Business Program
- Two High-Quality Games
- Tutorials on Programming
- And MUCH MORE !!

Volume 10 Now Available — Featuring an Advanced Sound Synthesizer

Volumes 1 through 9 Are Also Available

Dealers Welcome ! — Call (503) 654-2641 For Details.

Modem Master

The Fastest Commodore BBS Available!

- Works with 1541 or MSD Dual Drive
- 300/1200 Baud Operation
- New Punter File Transfer Protocol
- Fully Menu Driven
- Over 25 Commands
- Public Message Base
- Private E-Mail Base
- E-Mail Check at Sign-On
- Sub-Directories for File Transfer
- 250 User Capacity
- Accurate Clock/Calendar
- Printer Output
- Information Files
- "Old" E-Mail Deleted After One Week
- User Survey/Poll
- Set Up in Only 10 Minutes!

Only $29.95

TURBO CALC/64

A Great Beginner's Spreadsheet At an UNBELIEVABLE Price!!

- 100% Memory Resident
- 100% Machine Code and P-Code
- 100% Menu Driven
- Over 13 K RAM for Data
- Large Matrix, 100 Rows by 26 Columns
- On-Line Help Screens
- On-Screen Menu at All Times
- Full Printer Support
- Built-in Functions (SUM, AVG, MIN, MAX)

At last, a powerful, yet affordable spreadsheet!

ONLY $17.95

Disk-Lock V2.1

At Last! A professional copy protection system is available to YOU. Now you can protect your programs from most copy programs!

- Disk-Lock is Designed to Prevent Full Disk Copies.
- Stops Over 90% of All Copiers
- Offers Multiple Protection Schemes
- Place Protection on Any Track From 1 to 40!
- Fully Menu Driven

Only $39.95

The Complete Thriller Collection

All six thrilling adventures now together on one disk! Plus — as a bonus — **Three Hours To Live!** Each is a full-length machine language text adventures that will take you weeks to complete. They feature full-sentence input (not just two words!) with color and sound.

Includes:

- Night of the Walking Dead
- Perils of Darkest Africa
- Revenge of The Moon Goddess
- Son of Ali Baba
- Frankenstein's Legacy
- Shipwrecked!
- Plus Three Hours to Live

Only $24.95
For All SEVEN !

Aquarian Software
P.O. Box 22184
Portland, OR 97222

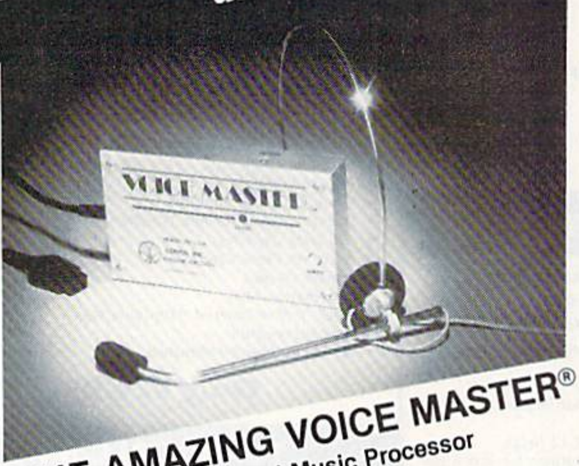
To Order, Call: (503) 654-2641
VISA and MasterCard Accepted

VISA MasterCard

Dealer Inquiries Welcome!

Add $3.00 S & H Per Order
Add $5.00 for COD
Canadian Orders: Add $10.00 S & H-U.S. Funds Only, Please.
Allow 4 to 5 weeks for delivery.

It Talks!
It Recognizes!
It Writes Music!
and more . . .



THE AMAZING VOICE MASTER®
Speech and Music Processor

Your computer can talk in your own voice. Not a synthesizer but a true digitizer that **records** your natural voice quality—and in any language or accent. Words and phrases can be expanded without limit from disk.

And it will understand what you say. A real word recognizer for groups of 32 words or phrases with unlimited expansion from disk memory. **Now you can have a two way conversation with your computer!**

Easy for the beginning programmer with new BASIC commands. Machine language programs and memory locations for the more experienced software author.

Exciting Music Bonus lets you hum or whistle to write and perform. Notes literally scroll by **as you hum!** Your composition can be edited, saved, and printed out. You don't have to know one note from another in order to write and compose!

Based upon new technologies invented by **COVOX**. One low price buys you the **complete system**—even a voice controlled black-jack game! In addition, you will receive a subscription to COVOX NEWS, a periodic newsletter about speech technology, applications, new products, up-dates, and user contributions. **You will never find a better value for your computer.**

ONLY $89.95 includes all hardware and software.

For telephone demonstration or additional information, call **(503) 342-1271.** FREE audio demo tape and brochure available.

Available from your dealer or by mail. When ordering by mail add $4.00 shipping and handling ($10.00 for foreign, $6.00 Canada).

The Voice Master is available for the C64, C128, all Apple II's, and Atari 800, 800XL and 130XE. Specify model when ordering.

VISA MasterCard *For Faster Service on Credit Card Orders only:*

ORDER TOLL FREE 1-800-523-9230

COVOX INC. (503) 342-1271
675-D Conger Street, Eugene, OR 97402
Telex 706017 (AV ALARM UD)

Listing 1 continued.

```
4706 PRINTX"RECORDS ARE CURRENTLY PRESENT":
     RETURN                            :REM*146
4708 REM----CHOOSE OPTION              :REM*224
4710 GOSUB4688:PRINT"{CRSR DN} CHANGE {CTRL
      9}N{CTRL 0}AME OF FIELD"         :REM*224
4712 PRINT"{8 SPACEs}{CTRL 9}L{CTRL 0}ENGTH
      OF FIELD"                        :REM*186
4714 PRINT"{5 SPACEs}OR {CTRL 9}A{CTRL 0}DD
      ANOTHER FIELD"                    :REM*82
4716 PRINT"{8 SPACEs}{CTRL 9}D{CTRL 0}ELETE
      A FIELD"                         :REM*216
4718 PRINT"{8 SPACEs}{CTRL 9}${CTRL 0} DISK
      DIRECTORY"                        :REM*72
4720 PRINT"{8 SPACEs}{CTRL 9}E{CTRL 0}XIT T
     O BEGINNING"                      :REM*154
4722 PRINT"{CRSR DN} {CTRL 9}{5 SPACEs}PRES
     S THE APPROPRIATE KEY{8 SPACEs}":REM*2
4724 PRINT"{3 SPACEs}ONLY ONE OPTION MAY BE
      PERFORMED{4 SPACEs}"             :REM*236
4726 K=0:GOSUB4606:IFA$="E"THEN4620:REM*186
4728 IFA$="$"THENGOSUB4896:GOTO4710:REM*242
4730 IFA$="N"THENK=1                    :REM*86
4732 IFA$="L"THENK=2                   :REM*102
4734 IFA$="A"THENK=3                   :REM*242
4736 IFA$="D"THENK=4                   :REM*134
4738 ONKGOTO4742,4754,4766,4778:GOTO4726
                                         :REM*2
4740 REM----CHANGE FIELD NAME          :REM*134
4742 GOSUB4688:INPUT" CHANGE NAME OF FIELD
     # ? 0{3 CRSR LFs}";CF:IFCF=<0THEN4710
                                         :REM*8
4744 IFCF>FTHENPRINT"{CRSR UP}":GOTO4742
                                        :REM*48
4746 PRINT" ENTER NEW FIELD NAME:":PRINT" ?
      ";F$(CF)                          :REM*46
4748 INPUT"{CRSR UP}{CRSR RT}";F$:IFF$=F$(C
     F)THEN4710                        :REM*170
4750 FT=F:GOTO4784                     :REM*198
4752 REM----CHANGE FIELD LENGTH         :REM*52
4754 GOSUB4688:INPUT" CHANGE LENGTH OF FIEL
     D # ? 0{3 CRSR LFs}";CF:IFCF=<0THEN471
     0                                   :REM*0
4756 IFCF>FTHENPRINT"{CRSR UP}":GOTO4754
                                        :REM*66
4758 PRINT" ENTER NEW FIELD LENGTH:":PRINT"
      ?";L%(CF)                        :REM*110
4760 INPUT"{CRSR UP}{CRSR RT}";L%:IFL%=L%(C
     F)THEN4710                         :REM*66
4762 L%(CF)=L%:FT=F:GOTO4784           :REM*104
4764 REM----ADD NEW FIELD              :REM*240
4766 GOSUB4688:PRINT" ADD NEW FIELD #{CTRL
     9}";F+1                            :REM*26
4768 PRINT" {CTRL 9}TITLE OF NEW FIELD":PRI
     NT" ? >":INPUT"{CRSR UP}{CRSR RT}";F$
                                       :REM*128
4770 PRINT" {CTRL 9}LENGTH OF NEW FIELD":PR
     INT" ? 0":INPUT"{CRSR UP}{CRSR RT}";L%
                                        :REM*66
4772 IFL%=0THEN4710                    :REM*182
4774 FT=F+1:CF=F+1:GOTO4784             :REM*18
4776 REM----DELETE EXISTING FIELD       :REM*44
4778 GOSUB4688:INPUT" DELETE WHICH FIELD? 0
     {3 CRSR LFs}";CF:IFCF=0THEN4710
                                       :REM*246
4780 FT=F-1                            :REM*240
4782 REM----CALCULATE # RECORDS        :REM*246
4784 MEM=29293:RL=0
                                        :REM*42
4786 FORJ=0TOF:IFK=4ANDJ=CFTHEN4790:REM*144
4788 RL=RL+L%(J)                       :REM*108
4790 NEXTJ:IFK=3THENRL=RL+L%            :REM*12
4792 RL=RL+3*(FT+1)+5                   :REM*70
4794 NR=INT((MEM-12*(FT+1)-2100)/RL)
                                       :REM*136
```

→

MUST LIQUIDATE At Far Below Dealer Cost!

TOTAL Personal Computer System

Factory Reconditioned with Factory Warranty!

GREAT GIFT IDEA FOR STUDENTS!

**Carries easily
as a suitcase!
Plugs into 115V outlet!**

Sorry, we're not permitted to PRINT the famous brand-name. BUT, we CAN "tell all" if you call us TOLL FREE: 1-800-328-0609!

THE COMPUTER

Snap-on computer keyboard! 64K RAM, 20K ROM. Full-size typewriter keyboard. Upper and lower case letters, numerals, symbols, reverse characters. 2 cursor control keys, 4 function keys, programmable to 8. Music synthesizer with 3 independent voices, each with 9 octave range. Input/output ports accommodate . . . user, serial, ROM cartridge, joysticks, external monitor, phone modem.

Built-in disk drive! Intelligent high speed unit with 5¼" floppy disk recorder. 170K formatted data storage; 35 tracks. 16K ROM. Uses single sided, single density disk. Serial interface. Second serial port to chain second drive or printer.

Built-in color monitor! Displays 40 columns x 25 lines of text on 5" screen. High resolution. 320 x 200 pixels. 16 background, character colors.

Built-in ROM cartridge port! Insert ROM program cartridge. Multitude of subjects available in stores across the nation!

Original List Price **$995.00**

Liquidation Priced At Only **$388**

Item H-827-63631-00 Ship, handling: $20.00

THE PRINTER

Print method: Bi-directional impact dot matrix.

Character matrix: 6 x 7 dot matrix.

Characters: Upper and lower case letters, numerals and symbols. All PET graphic characters.

Graphics: 7 vertical dots — maximum 480 columns. Dot addressable.

Character codes: CBM ASCII code.

Print speed: 60 characters per second.

Maximum columns: 80 columns.

Character spacing: 10 characters per inch.

Line feed spacing: 6 lines per inch in character mode or 8 lines per inch selectable. 9 lines per inch in graphics mode.

Line feed speed: 5 lines per second in character mode. 7.5 lines per second in graphics mode.

Paper feed: Friction feed.

Paper width: 4.5" to 8.5" width.

Multiple copies: Original plus maximum of two copies.

Dimensions: 13"W x 8"D x 3¼"H. Wt.: 6½ lbs. **Power:** 120V AC, 60 Hz.

Original List Price: $200.00

Liquidation Priced At **$118**

Item H-827-63681-00 Ship, handling: $7.00

THE SOFTWARE

"Easy Script" One of the most powerful word processors at any price! Cut re-typing, create documents from standard paragraphs, do personalized letters, see and change a document before it is printed. Instruction manual has extensive training section that simplifies use . . . even for someone who has never used a computer or word processor before!

"The Manager" A sophisticated database manager for business or home use. Business uses: accounts payable/receivable, inventory, appointments, task manager. Home uses: mailing lists, home inventory, recipes, collection organizer, investment tracking, checkbook balancing. School uses: research article index, gradebook.

Original List Price: $73.98

Liquidation Price **$24**

Item H-827-64011-03 Ship, handling: $3.00

BUY INDIVIDUAL UNITS OR GET THIS ULTRA-FAMOUS SYSTEM AT ONE LOW PACKAGE PRICE!

TOTAL Personal Computer System available at FAR BELOW dealer cost!

Original List Price **$1,293.00**

TOTAL PACKAGE PRICE **$488**

Item H-827-64011-02 Ship, handling: $24.00

Compatible with above Computer System (Not included in package price.)

JOYSTICKS (Set of 2)

Mfr. List: $59.90 pr.

Liquidation Price . . . . **$18 pr.**

Item H-827-63622-01 S/H: $6.00 pr.

64 MODEM

Mfr. List: $124.95

Liquidation Price **$19**

Item H-827-63646-01 S/H: $4.00

VISA MasterCard

Credit card members can order by phone, 24 hours a day, 7 days a week.

Toll-Free: 1-800-328-0609

TeleCheck **Your check is welcome! No delays when you pay by check!**

C.O.M.B. CO.®

Authorized Liquidator

**14605 28TH AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55441-3397**

SEND ME THE ITEMS I HAVE LISTED BELOW

Price subject to change after 60 days. Sales outside continental U.S. are subject to special conditions. Please call or write to inquire.

Item No.	#	Item	Price	S/H
		TOTAL		

C.O.M.B. CO.® Item H-827
14605 28th Ave. N./Minneapolis, MN 55441-3397

Send the items indicated at left. (Minnesota residents add 6% sales tax. Please allow 3-4 weeks delivery. Sorry, no C.O.D.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)

Charge: ☐ MasterCard® ☐ VISA

Acct. No. ______________ Exp. ______

PLEASE PRINT CLEARLY

Name ______________

Address ______________

City ______________

State ______________ ZIP ______

Phone ______________

Sign here ______________

Listing 1 continued.

```
4796 PRINT"{CRSR DN} YOUR SELECTIONS WILL A
     LLOW APPROX"                     :REM*100
4798 PRINTNR;"RECORDS.{2 SPACEs}{CTRL 9}A{C
     TRL 0}CCEPT OR {CTRL 9}R{CTRL 0}EJECT?
     "                                  :REM*8
4800 GOSUB4606:IFA$="R"THEN4710       :REM*164
4802 IFA$<>"A"THEN4800                :REM*158
4804 REM----LOAD FILE                 :REM*238
4806 OPEN15,8,15:OPEN5,8,5,"0:DF] "+NF$+",S
     ,R":GOSUB4612:IFET=8THEN4710     :REM*174
4808 IFEN=62THENGOSUB4614:GOTO4710    :REM*46
4810 INPUT#5,R,F,X:GOSUB4612:IFET=8THEN4710
                                      :REM*16
4812 FORN=1TOF:INPUT#5,F$(N),L%(N):NEXTN:GO
     SUB4612:IFET=8THEN4710           :REM*154
4814 FORI=1TOX:PRINT"{CRSR DN} READING RECO
     RD #";I;"{2 CRSR UPs}"           :REM*130
4816 FORN=1TOF:INPUT#5,REC$(I,N):NEXTN:NEXT
     I:PRINT:GOSUB4612:IFET=8THEN4710
                                      :REM*104
4818 FORI=1TOX:PRINT"{CRSR DN} READING POIN
     TERS";I;"{2 CRSR UPs}":INPUT#5,K%(I):N
     EXTI                             :REM*212
4820 S=ST:IFS<>0THEN4824              :REM*62
4822 INPUT#5,E$:GOSUB4612             :REM*178
4824 CLOSE5:CLOSE15                   :REM*180
4826 REM----SAVE RESTRUCTURED FILE :REM*106
4828 IFK=1THENF$(CF)=F$               :REM*22
4830 IFK=2THENL%(CF)=L%               :REM*62
4832 CR$=CHR$(13):PRINT"{SHFT CLR} INSERT T
     HE DISK TO RECEIVE THE FILE."  :REM*64
4834 PRINT" ENTER NAME OF RESTRUCTURED FILE
      TO BE"                          :REM*124
4836 PRINT" SAVED (12 CHARACTERS MAX). IF T
     HE OLD"                          :REM*142
4838 PRINT" FILE NAME IS CHOSEN, THE OLD FI
     LE"                              :REM*142
4840 PRINT" WILL BE RENAMED WITH !OLD.{2 CR
     SR DNs}"                         :REM*20
4842 PRINT"{2 SPACEs}";NF$:INPUT"{CRSR UP}"
     ;NF$:IFNF$=""THEN4710            :REM*138
4844 OPEN15,8,15:PRINT#15,"S0:DF] "+LEFT$(N
     F$,8)+"!OLD"                     :REM*30
4846 GOSUB4612:IFET=8THEN4710         :REM*190
4848 PRINT#15,"R0:DF] "+LEFT$(NF$,8)+"!OLD=
     DF] "+NF$:GOSUB4612:IFET=8THEN4710
                                      :REM*242
4850 OPEN5,8,5,"0:DF] "+NF$+",S,W":GOSUB461
     2:IFET=8THEN4710                 :REM*194
4852 IFX>NRTHENX=NR                   :REM*206
4854 PRINT#5,NR;CR$;FT;CR$;X          :REM*202
4856 FORN=1TOF:IFK=4ANDN=CFTHEN4860:REM*198
4858 PRINT#5,F$(N);CR$;L%(N)          :REM*254
4860 NEXTN:IFK=3THENPRINT#5,F$;CR$;L%
                                      :REM*72
4862 GOSUB4612:IFET=8THEN4710         :REM*206
4864 FORI=1TOX:PRINT"{CRSR DN} SAVING RECOR
     D #";I;"{2 CRSR UPs}"            :REM*73
4866 FORN=1TOF:IFK=4ANDN=CFTHEN4870:REM*241
4868 PRINT#5,REC$(K%(I),N)            :REM*155
4870 NEXTN:IFK=3THENPRINT#5,">"       :REM*15
4872 NEXTI:PRINT:GOSUB4612:IFET=8THEN4710
                                      :REM*43
4874 FORI=1TOX:PRINT"{CRSR DN} SAVING POINT
     ERS";I;"{2 CRSR UPs}":PRINT#5,I:NEXTI
                                      :REM*243
4876 PRINT#5,"EOF":GOSUB4612:IFET=8THEN4710
                                      :REM*21
4878 CLOSE5:CLOSE15                   :REM*235
4880 IFX>NRTHENPRINT"THE LAST"X-NR"RECORDS
     WERE DELETED"                    :REM*229
4882 REM--REREAD NEW STRUCTURE        :REM*139
4884 OPEN15,8,15:OPEN5,8,5,"0:DF] "+NF$+",S
     ,R":GOSUB4612:IFET=8THEN4710     :REM*253
4886 IFEN=62THENGOSUB4614:GOTO4710 :REM*125
4888 INPUT#5,R,F,X:GOSUB4612:IFET=8THEN4710
                                      :REM*95
4890 FORN=1TOF:INPUT#5,F$(N),L%(N):NEXTN:GO
     SUB4612:IFET=8THEN4710           :REM*233
4892 CLOSE5:CLOSE15:GOTO4710          :REM*235
4894 REM--DIRECTORY                   :REM*153
4896 OPEN15,8,15:OPEN5,8,0,"$0":PRINT"{SHFT
      CLR}":GOSUB4612:IFET=8THENRETURN
                                      :REM*189
4898 GET#5,A1$,A2$                    :REM*237
4900 GET#5,A1$,A2$                    :REM*239
4902 GET#5,A1$,A2$                    :REM*241
4904 IFA1$<>""THENA0=ASC(A1$)         :REM*123
4906 IFA2$<>""THENA0=A0+ASC(A2$)*256:REM*79
4908 PRINTMID$(STR$(A0),2);TAB(3); :REM*159
4910 GET#5,A2$:IFST<>0THEN4928        :REM*207
4912 IFA2$<>CHR$(34)THEN4910          :REM*47
4914 GET#5,A2$:IFA2$<>CHR$(34)THENPRINT"{CT
     RL 9}"A2$"{CTRL 0}";:GOTO4914    :REM*83
4916 GET#5,A2$:IFA2$=CHR$(32)THEN4916
                                      :REM*239
4918 PRINTTAB(20);:A3$=""             :REM*129
4920 A3$=A3$+A2$:GET#5,A2$:IFA2$<>""THEN492
     0                                :REM*211
4922 PRINTLEFT$(A3$,3)                :REM*183
4924 GETA$:IFA$<>""THENGOSUB4932      :REM*75
4926 IFST=0THEN4900                   :REM*125
4928 PRINT" BLOCKS FREE";:A0=0        :REM*141
4930 CLOSE5:CLOSE15:PRINTTAB(25)"PRESS {CTR
     L 9}ANY KEY{CTRL 0}":GOSUB4606:RETURN
                                      :REM*119
4932 GOSUB4606:RETURN                 :REM*211
```

Circle 202 on Reader Service card.

Program Your Own EPROMS

▶ VIC 20
▶ C 64

$99.50

promenade
MODEL C1
PWR
SKT
PGM
JASON-RANHEIM
SAN JOSE, CA USA

PLUGS INTO USER PORT.
NOTHING ELSE NEEDED.
EASY TO USE. VERSATILE.

- Read or Program. One byte or 32K bytes!

OR Use like a disk drive. LOAD, SAVE, GET, INPUT, PRINT, CMD, OPEN, CLOSE—**EPROM FILES!**

Our software lets you use familiar BASIC commands to create, modify, scratch files on readily available EPROM chips. Adds a new dimension to your computing capability. Works with most ML Monitors too.

- Make Auto-Start Cartridges of your programs.
- The *promenade*™ C1 gives you 4 programming voltages, 2 EPROM supply voltages, 3 intelligent programming algorithms, 15 bit chip addressing, 3 LED's and NO switches. Your computer controls everything from software!
- Textool socket. Anti-static aluminum housing.
- EPROMS, cartridge PC boards, etc. at extra charge.
- Some EPROM types you can use with the *promenade*™

2758	2532	462732P	27128	5133	X2816A*
2516	2732	2564	27256	5143	52813*
2716	27C32	2764	68764	2815*	48016P*
27C16	2732A	27C64	68766	2816*	

▶ *Commodore Business Machines

*Denotes electrically eraseabl types

Call Toll Free: 800-421-7731 **or 408-287-0259**
In California: 800-421-7748

JASON-RANHEIM
580 Parrott St., San Jose, CA 95112

promenade™

VISA
MasterCard

Circle 14 on Reader Service card.

EASTCOAST SOFTWARE

ecs... inflation-fighting prices.

No hidden charges! No credit card fees!

COMMODORE

CAT #		LIST	OUR PRICE
2741	ACCT PAY MGMT/CHECKS (D)	59.95	40.60
2740	ACCT RECEIVE/INVOICE (D)	59.95	40.60
3448	ADDITION MAGICIAN (D)	34.95	22.40
3497	ADVENT.WRITER W/GRAPHICS	50.00	38.45
1350	ADVENTURE CONSTR'N SET (D)	50.00	29.25
0770	AGENT USA (D)	29.95	19.20
0064	ALIEN ADDITION (D)	34.00	23.05
0335	ALLIGATOR MIX (D)	34.00	21.80
2713	ALPHABET ZOO (D)	26.95	18.25
2913	ARCHON (D)	40.00	17.05
1342	ARCHON II - ADEPT (D)	40.00	28.50
1733	ASSEMBLER/MONITOR-64 (D)	39.95	30.75
2914	AXIS ASSASIN (D)	35.00	24.95
3598	BANK ST.WRITING SKILLS	75.00	55.00
1412	BANK STREET MUSICWRITER	39.95	25.60
1764	BANK STREET WRITER (D)	49.95	32.05
0820	BARRON'S STUDY FOR SAT (D)	89.95	60.90
0904	BATTLE FOR NORMANDY (D)	39.95	27.05
0262	BEACH HEAD (D)	34.95	23.65
3117	BEACH HEAD 2	39.95	27.05
0394	BELOW THE ROOT (D)	26.95	18.20
0087	BEYOND CASTLE WOLFEN' (D)	34.95	22.45
3182	BLUE MAX 2001 (D)	29.95	20.30
1998	BOSTON COMPUTER DIET	99.95	64.10
2033	BREAK THROUGH ARDENNES(D)	59.95	38.45
1133	BRUCE LEE (D)	39.95	27.05
2189	BUILD A BOOK	39.95	25.65
2225	BUMBLE GAMES (D)	39.95	25.60
3449	BUMBLE PLOT (D)	39.95	27.00
0201	CARRIER FORCE (D)	59.95	40.60
2618	CARRIERS AT WAR	50.00	36.55
2723	CAVE OF WORD WIZARD (D)	34.95	22.40
3568	CHARLIE BROWN'S ABC(D)	29.95	20.30
0527	CHARTPAK-64 (D)	39.95	30.75
1154	CODEWRITER (D)	100.00	76.95
1404	COMMODORE 1525 RIBBON	7.75	4.95
1986	COMMODORE 1526 RIBBON	6.25	4.95
0416	COMPUSERVE STARTER KIT	39.95	17.05
2337	COMPUTER SAT (D)-HARCOURT	79.95	51.20
3467	COPY 2 64 (VS 1.5)	39.95	20.50
1798	CREATIVE 3-PACK (D)	149.95	94.75
3033	CROSSWORD MAGIC	49.95	32.05
2917	CUT & PASTE (D)	50.00	35.65
1593	D-BUG (D)	35.00	12.50
0103	DEMOLITION DIVISION (D)	34.00	21.80
2292	DINOSAURS (D)	34.95	22.40
1539	DISK 3-RING VINYL PAGES-10	6.75	4.10
1166	DISK BANK (50)	19.95	11.00
2254	DOODLE (D)	39.95	28.90
3379	DRAGON MIX (D)	34.00	21.80
1288	DRAGONWORLD (D)	32.95	21.15
2285	DUST COVER EPSON RX 80	7.99	5.75
1759	DUSTCOVER-1526 PRINT(TAN)	7.99	5.75
1752	DUSTCOVER-1541 DRIVE(TAN)	7.99	5.75
0128	DUSTCOVER-801 PRINT(TAN)	7.99	5.75
1749	DUSTCOVER-COMM.64 (TAN)	7.99	5.75
1371	DUSTCOVER-OKIMATE 10	8.95	5.75
2340	EARLY GAMES CHILDREN (D)	34.95	22.40
2273	EASY AS ABC (D)	39.95	25.65
1470	ELEPHANT DISKS DS/DD (10)	50.00	16.05
0092	ELEPHANT DISKS SS/DD (10)	37.00	14.75
1337	ELEPHANT DISKS SS/SD (10)	34.00	14.10
0154	ENCHANTER (D)	34.95	22.45
0107	EPSON MX-80 RIBBON	14.00	6.30
3233	EUROPE ABLAZE	49.95	38.45

EASTCOAST SOFTWARE

49 Derrytown Mall
Hershey, PA 17033

MAIL YOUR ORDER OR CALL
(717) 533-8125
800-233-3237

We Ship UPS—Shipping 1% ($2.50 min.)
C.O.D. Add An Additional $2.50
Hardware (Printers/Monitors)
Shipping is $2.50 +4% (U.P.S.)
For Air Mail, Canadian, APO/FPO Orders,
Shipping $2.50 +4% of Total Order (US Funds)
PA Residents Add 6% Tax

No Minimum Order
Visa-Mastercard-C.O.D.-Check

Prices Subject To Change
Sorry, No Foreign Orders

CAT #		LIST	OUR PRICE
1535	F-15 STRIKE EAGLE (D)	34.95	22.45
0963	FAMILY ROOTS (D)	185.00	155.15
1918	FAST LOAD (R)	39.95	27.05
1754	FELONY (D)	34.95	23.65
3585	FIGURES AND FORMULAS	29.95	20.30
0587	FINANCIAL COOKBOOK (D)	50.00	29.25
3083	FLEET SYSTEM 2	79.95	54.15
2973	FLIGHT SIMULATOR II (D)	49.95	35.25
2918	FLIP & FILE W/LOCK (50)	39.95	23.85
1440	FLIP-N-FILE (50 DISKS)	19.95	11.30
1153	G.I. JOE (D)	40.00	20.30
0842	GAME SHOW (D)	39.95	25.60
2739	GENERAL LEDGER (D)	59.95	40.60
1824	GENERIC DISKS SS/DD (10)	19.95	9.75
3450	GERTRUDE'S PUZZLES (D)	44.95	30.40
3451	GERTRUDE'S SECRETS (D)	29.95	19.20
3060	GET READY READ/ADD-SCHOOL	55.00	42.30
3185	GOLDEN OLDIES	29.95	23.10
1533	GRAMMAR EXAMINER (D)	44.95	28.80
2478	HALLEY PROJECT	39.95	25.60
2911	HARD HAT MACK (D)	35.00	24.95
3184	HEART OF AFRICA	34.95	25.65
2137	HELLCAT ACE (D)	29.95	20.30
0896	HITCHHIKER GUIDE GALAXY(D)	34.95	22.45
1782	HOME ACCOUNTANT (D)	74.95	48.05
2297	HOMEWORD (D)	49.95	32.05
3065	HOMEWORD SPELLER (D)	34.95	22.45
2762	IMPERIAL GALACTICUM (D)	39.95	25.60
2868	IN SEARCH OF/AMAZING (D)	32.95	22.55
3167	INDIANA JONES (D)	29.95	19.20
2953	INFIDEL (D)	39.95	25.65
1786	INFOCOM SAMPLER (D)	7.95	5.10
1119	INSIDE COMMODORE DOS	19.95	14.05
2227	JUGGLES RAINBOW (D)	29.95	19.20
2584	KAMPEGRUPPE	59.95	38.45
0812	KARATEKA (D)	29.95	19.25
2936	KENNEDY APPROACH (D)	34.95	22.40
1333	KOALA GRAPHIC TABLET-DISK	79.95	51.25
1883	KRAFT JOYSTICK - C64/V20	9.95	6.40
0633	KWIK-LOAD (D)	19.95	13.55
2972	LABELS 1-IN WHITE (1000)	9.95	6.75
0828	LEARNING BRIDGE-GOREN (D)	79.95	51.25
2989	LODE RUNNER (D)	39.95	25.60
1607	LODE RUNNER-CHAMPION (D)	34.95	22.45
0873	MACH 5 (R)	34.95	23.65
1282	MAGIC SPELLS (D)	34.95	22.40
1343	MAIL ORDER MONSTERS (D)	35.00	24.35
3037	MASTER MATCH	34.95	22.40
1827	MASTER MODEM	59.95	39.45
1886	MASTER TYPE (D)	39.95	25.60
1089	MASTERING THE SAT (D)	79.95	51.25
2970	MATH BLASTER! (D)	49.95	32.00
0089	MAXELL SS/DD DISKS (10)	38.70	16.55
0942	MERLIN 64	49.95	32.00
3072	METEOR MULTIPLICATION (D)	34.00	21.80
0080	MICROLEAGUE BASEBALL	39.95	27.05
2601	MILLIONAIRE (D)	29.95	19.20
1383	MIND PROBER (D)	29.95	20.30
0109	MINUS MISSION (D)	34.00	21.80
1697	MIRAGE DB MGR/REP GEN (D)	49.95	33.85
0666	MIRAGE WORD PROCESSOR (D)	49.95	33.85
1967	MISSING LINKS (HOME)	44.95	31.70
0960	MISSION ALGEBRA	44.95	28.80
0897	MONTY PLAYS SCRABBLE (D)	39.95	27.05
1284	MOPTOWN HOTEL (D)	39.95	25.60
3453	MOPTOWN PARADE (D)	39.95	25.60
0182	MOVIEMAKER (D)	34.95	26.95
1709	MR. PRINTER STAND	29.95	20.30
2197	MR.RODGERS MANY WAYS (D)	29.95	20.30
1523	MUPPET LEARN KEYBOARD (D)	79.95	51.25
0763	MURDER BY THE DOZEN (D)	34.95	22.40
0323	MURDER ON ZINDERNEUF (D)	40.00	28.50
2912	MUSIC CONSTRUCTION SET (D)	40.00	28.50
0207	MUSIC MAESTRO (D)	34.95	23.65
0487	MUSIC SHOP	44.95	28.85
2318	MUSICALC 1 (D)	49.95	33.80
1469	NET WORTH (D)	79.95	51.20
0327	ONE ON ONE (D)	40.00	24.35
0821	PAPER CLIP W/SPELL PAK (D)	119.95	76.90
0576	PASCAL-64 (D)	39.95	30.75
3572	PEANUT'S PICTURE PUZZLE	29.95	20.30
1627	PFS FILE (D)	49.95	33.80
2569	PHANTASIE	39.95	25.65
2915	PINBALL CONSTRUCT SET (D)	40.00	28.50
2201	PLANETFALL (D)	34.95	22.45
0727	POLE POSITION (D)	29.95	20.30
2820	PRACTICALC (D)	29.95	19.20
0882	PRACTIFILE 64 (D)	29.95	20.30
1711	PRINT SHOP (D)	44.95	28.85

800-233-3237
In PA 717-533-8125

This Ad Prepared September 1985

CAT #		LIST	OUR PRICE
2498	PRINTSHOP GRAPHICS 2	24.95	16.00
1712	PRINTSHOP GRAPHICS LIB (D)	24.95	16.00
0256	PRINTSHOP PAPER PACK	19.95	12.70
0344	PRO BLACKJACK - USTON (D)	69.95	47.35
0906	PROFESSIONAL TOUR GOLF (D)	39.95	25.65
1279	PROWRITER NYLON RIBBON	10.00	6.65
1503	QUESTRON (D)	39.95	25.65
1344	RACING DESTRUCTION SET (D)	35.00	24.35
1392	RAID ON BUNGELING BAY (D)	29.95	19.20
1297	RAID OVER MOSCOW (D)	39.95	27.05
2035	READER RABBIT (D)	39.95	25.60
1348	REALM OF IMPOSSIBILITY (D)	35.00	24.95
1292	RENDEZVOUS WITH RAMA (D)	32.95	21.15
0176	ROCKY'S BOOTS (D)	49.95	33.85
1483	SARGON III (D)	49.95	32.05
1221	SEASTALKER (D)	34.95	22.45
1726	SIDEWAYS	29.95	19.20
2282	SKY TRAVEL	34.95	23.65
2510	SKYFOX	39.95	24.35
2314	SNOOPER TROOPS 1	26.95	17.30
3575	SNOOPY'S READ MACHINE	29.95	20.30
1102	SORCERER (D)	39.95	25.65
2682	SPEED READER II (D)	69.95	44.85
2310	SPELLICOPTER (D)	39.95	25.60
1155	SPREADSHEET (D)	49.95	32.00
1897	STAR LEAGUE BASEBALL (D)	29.95	20.35
1581	STATES & TRAITS (D)	44.95	28.80
3092	STICKY BEAR ABC (D)	29.95	19.20
3090	STICKY BEAR NUMBERS(D)	29.95	19.20
2687	SUCCESS MATH ADD/SUB (D)	24.95	16.00
2685	SUCCESS MATH MULT/DIV (D)	24.95	16.00
1948	SUPER C COMPILER	79.95	61.50
1848	SUPER PASCAL	59.95	46.15
0759	SUPERCLONE W/UNGUARD (D)	49.95	37.20
2551	SURVIVAL GUIDE TO 1541	5.00	3.75
2874	THE CONSULTANT (D)	79.95	51.30
0859	TIC TAC SHOW (D)	34.95	22.40
1238	TYPING TUTOR 3 (D)	39.95	25.65
0884	ULTIMA III (EXODUS) (D)	54.95	40.60
2992	VERBATIM DS/DD DISKS (10)	47.50	23.10
0093	VERBATIM SS/DD SOFTPACK	34.50	16.40
1072	VIP TERMINAL XL	49.95	38.40
1529	VISIBLE COMPUTER 6502 (D)	40.00	25.65
1916	WICO 3-WAY JOYSTICK	34.95	22.35
0002	WICO JOYSTICK	29.95	20.30
1885	WITNESS (D)	34.95	22.45
2684	WORD ATTACK (D)	49.95	32.00
3443	WORD CHALLENGE (D)	39.95	27.05
3399	WORD INVASION (D)	34.00	21.80
3411	WORD RADAR (D)	34.00	21.80
2889	WORDPRO 3 + W/SPELL (D)	99.95	67.65

Key
(D) Disk Program
(R) Rom Cartridge
(C) Cassette Program

Many More Titles Available!

Commodore® is a registered trademark of COMMODORE ELECTRONICS, LTD

VISA®

master charge
THE INTERBANK CARD

CHECK ONE: ☐ VISA ☐ MASTERCARD

Card# ____________________ Exp. ____________

Telephone ______________________________

Name ______________________________

Address ______________________________

City ______________________________

State ____________________ Zip ____________

Please enter my order for: ____________________

____

____

Please specify machine: ____________________

☐ *Please send free catalog.*

Circle 15 on Reader Service card.

COMMODORE 64 COMPUTER

$139.95

- 170K Disk Drive $139.95
- Commodore Graphics Printer $99.95
- 14" Commodore Color Monitor $149.95

COMPUTER AND SOFTWARE SALE

CALL BEFORE YOU ORDER

PRICES MAY BE LOWER

C128 COMMODORE COMPUTER

NEW

(Order Now)

$289.95

- 340K 1571 Disk Drive $259.00
- Voice Synthesizer $39.95
- 12" Green or Amber Monitor $59.95
- Printer/Typewriter Combination $249.95

COMMODORE 64 COMPUTER $139.95

You pay only $139.95 when you order the powerful 84K COMMODORE 64 COMPUTER! LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your computer that allows you to SAVE OVER $500 off software sale prices!! With only $100 of savings applied, your net computer cost is $29.95!!

170K DISK DRIVE $139.95

You pay only $139.95 when you order the 170K Disk Drive! LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your disk drive that allows you to SAVE OVER $500 off software sale prices!! With only $100 of savings applied, your net disk drive cost is $39.95.

14" COMMODORE COLOR MONITOR $149.95

You pay only $149.95 when you order this 14" COLOR MONITOR with sharper and clearer resolution than any other color monitors we have tested! LESS value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your monitor that allows you to save over $500 off software sale prices!! With only $100 of savings applied, your net color monitor cost is only $49.95. (16 Colors).

80 COLUMN COMMODORE GRAPHICS PRINTER $99.95

You pay only $99.95 when you order the 803 Commodore Graphics Printer, 60 CPS, Dot Matrix, Bi-Directional, Prints 8½" full size paper. Plug in direct interface included! LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your printer that allows you to SAVE OVER $500 off software sale prices!! With only $100 of savings applied your net printer cost is ZERO!

80 COLUMN BOARD $59.95

Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! PLUS 4 slot expander!

80 COLUMNS IN COLOR PAPERBACK WRITER 64 WORD PROCESSOR $39.95

This PAPERBACK WRITER 64 WORD PROCESSOR is the finest available for the COMMODORE 64 computer! The ULTIMATE FOR PROFESSIONAL Word Processing. DISPLAYS 40 or 80 COLUMNS IN COLOR or black and white! Simple to operate, powerful text editing complete cursor and insert delete key controls line and paragraph insertion, automatic deletion, centering, margin settings and output to all printers! List $99.00. **SALE $39.95**. Coupon $29.95.

SPECIAL SOFTWARE COUPON

We pack a SPECIAL SOFTWARE DISCOUNT COUPON with every COMMODORE 64 COMPUTER, DISK DRIVE, PRINTER, or MONITOR we sell! This coupon allows you to SAVE OVER $500 OFF SALE PRICES!!

(Examples)

PROFESSIONAL SOFTWARE COMMODORE 64

Name	List	Sale	Coupon
Paperback Writer 64	$99.00	$39.95	$29.95
Paperback Data Base	$69.00	$34.95	$24.95
Paperback Dictionary	$24.95	$14.95	$10.00
Practicalc II	$69.95	$49.95	$44.95
Print Shop (Disk)	$44.95	$32.95	$26.95
Practicalc	$59.95	$24.95	$19.95
Programmers Reference Guide	$20.95	$16.95	$12.50
Programmers Helper (Disk)	$59.95	$29.95	$19.95
80 Column Screen (Disk)	$59.95	$29.95	$19.95
Disk Filer (by Flip-N-File)	$39.95	$14.95	$12.95
Deluxe Tape Cassette	$89.00	$44.95	$34.95
Pro Joy Stick	$19.95	$12.95	$10.00
Light Pen	$39.95	$14.95	$ 9.95
Dust Cover	$ 8.95	$ 6.95	$ 4.60
Simon's Basic	$29.95	$22.95	$19.95
Pitstop II Epyx	$39.95	$22.95	$19.95
Super Graphics Expander	$29.95	$22.95	$19.95
Music Calc 1	$59.95	$29.95	$12.95
Filewriter	$59.95	$29.95	$24.95

(See over 100 coupon items in our catalog)

Write or call for Sample SPECIAL SOFTWARE COUPON!

ATTENTION Computer Clubs

We Offer Big Volume Discounts

CALL TODAY!

PROTECTO WARRANTY

All Protecto's products carry a minimum 90 day warranty. If anything fails within 90 days from the date of purchase, simply send your product to us via United Parcel Service prepaid. We will IMMEDIATELY send you a replacement at no charge via United Parcel Service prepaid. This warranty proves once again that ***We Love Our Customers.***

C128 COMMODORE COMPUTER $289.95

We expect a limited supply for Christmas. We will ship on a first order basis. This all-new revolutionary 128K computer uses all Commodore 64 software and accessories plus all CPM programs formatted for the disk drive.
List $349.00. **SALE $289.95.**

340K 1571 COMMODORE DISK DRIVE $259.00

Double Sided, Single Disk Drive for C-128 allows you to use C-128 mode plus CPM mode. 17 times faster than 1541, plus runs all 1541 formats.
List $349.00. **Sale $259.00.**

SUPER AUTO DIAL MODEM $39.95

Easy to use. Just plug into your Commodore 64 computer and you're ready to transmit and receive messages. Easier to use than dialing your telephone, just push one key on your computer! Includes exclusive easy to use program for up and down loading to printer and disk drives. ***Best in U.S.A.***
List $129.00. **SALE $39.95.**

VOICE SYNTHESIZER $39.95

For Commodore-64 computers. Just plug it in and you can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies!! FOR ONLY $19.95 you can add TEXT TO SPEECH, just type a word and hear your computer talk — ADD SOUND TO "ZORK", SCOTT ADAMS AND OTHER ADVENTURE GAMES!!
(Disk or tape.) List $89.00. **SALE $39.95**

12" GREEN OR AMBER MONITOR $59.95

Your choice of green or amber screen monitor, top quality, 80 columns x 24 lines, easy to read, anti-glare! PLUS $9.95 for connecting cable. Com-64 or VIC-20. List $159.00. **SALE $59.95.**

PRINTER/TYPEWRITER COMBINATION $249.95

"JUKI" Superb letter quality, daisy wheel printer typewriter combination. Two machines in one — just a flick of the switch. 12" extra large carriage, typewriter keyboard, automatic margin control and relocate key, drop in cassette ribbon! (90 day warranty) centronics parallel or RS232 serial port built in (Specify). List $349.00. **SALE $249.95. (Ltd. Qty.)**

13" RGB & COMPOSITE COLOR MONITOR $259.95

Must be used to get 80 columns in color with 80 column computers (C128 - Atari ST - IBM - Apple). (Add $14.50 shipping)
List $399.00. **SALE $259.95.**

- LOWEST PRICES • 15 DAY FREE TRIAL
- BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL

PHONE ORDERS
8 a.m. - 8 p.m. Weekdays
9 a.m. - 12 noon Saturdays

- 90 DAY FREE REPLACEMENT WARRANTY
- OVER 500 PROGRAMS • FREE CATALOGS

* Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

Circle 15 on Reader Service card.

COLOR MONITOR

Sale

SALE!!!

16 COLORS

(Premium Quality)

- **Built in Speaker and Audio**
- **Front Panel Controls**
- **For Video Recorders**
- **For Small Business Computers**
- **Apple - Commodore - Atari - Franklin - etc.**

(Premium Quality)

- **Beautiful Color Contrast**
- **High Resolution**
- **Separated Video**
- **Sharp Clear Text**
- **Anti-Glare Screen**
- **40 Columns x 24 Lines**
- **Supports 80 Columns**

List $329⁰⁰

RGB

IBM, C-128, Apple, Atari ST

13" Color Computer Monitor

*Connecting cable $9.95

Sale $159⁹⁵*

13" RGB & COMPOSITE COLOR MONITOR

Allows use of C-128 and C64 mode - composite and 80 column RGB mode. Must be used to get 80 columns in color with 80 column computers (IBM, C-128, Apple & Atari ST). (add $14.50 shipping) List $399.00 **Sale $259⁹⁵***

14" COMMODORE COLOR MONITOR

(add $14.50 shipping) List $299.00 **Sale $149⁹⁵***

15 Day Free Trial - 90 Day Immediate Replacement Warranty

12" XTRON SUPER HI-RESOLUTION MONITOR

80 Columns x 24 Lines, Super Hi-Resolution 800 lines Green or Amber Super-Clear "Easy to Read" text with special anti-glare screen! *(Ltd. Qty.)* List $249.00 **Sale $109⁹⁵***

12" ZENITH HI-RESOLUTION GREEN OR AMBER TEXT DISPLAY MONITOR

80 Columns x 24 Lines, Hi-Resolution, crisp clear easy to read text with anti-glare screen! A MUST for word processing. *(Ltd. Qty.)* List $199.00 **Sale $89⁹⁵***

12" MONITOR GREEN OR AMBER TEXT

80 Columns x 24 Lines, easy to read up front controls *(Ltd. Qty.)* List $159.00 **Sale $59⁹⁵***

* Connecting cable $9.95

• LOWEST PRICES • BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.
Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders, 1 day express mail!
VISA — MASTER CARD — C.O.D.
No C.O.D. to Canada, APO-FPO.

COMPUTER DIRECT

We Love Our Customers
Box 1001, Barrington, Ill. 60010
312/382-5050 to order

Brainstorming

Having trouble collecting your thoughts? First get them onto the screen, then let this program help you organize them into a logical outline.

By MARK JORDAN

Do you have a word processor? Then you know how much easier it is to organize your writing. Move a paragraph here, juggle a word there.

Word processing does for writing what the cotton gin did for processing cotton. But word processing still means a lot of thinking and hard work. No matter how smoothly your software picks, sorts and separates those thoughts, it's still up to you to get them planted.

Until now. Enter Brainstorm. Brainstorm is a pre-word processor program; it makes pre-writing almost as much fun as word processing. Brainstorm helps organize your raw, fragmented thoughts into polished, organized groups. The end product is a classical outline, complete with Roman numeral headings, uppercase letter subheadings and Arabic numeral sub-subheadings—just as the English teacher ordered.

As a matter of fact, besides being a freelance writer, I'm an English teacher, and I wrote this program to help my students learn to outline. After it was completed, I found that it improved my own writing.

As a teacher, I know and have always taught that brainstorming and outlining are prerequisites to good writing. In the germination stage of creating, it is best to let the right hemisphere of the brain flow freely. The right brain can't stand to be bogged down with rigid, left-brain standards.

Initially, Brainstorm just asks you to freely express your ideas, unimpeded by logic, convention or whatever standards your left brain imposes. Subsequent stages then help you create an outline of your thoughts.

Brainstorm can also help you program. In the initial stages of programming, you should think through the problem in English phrases and work out the logic at this level before doing actual coding.

Perhaps the greatest value of Brainstorm is that it improves thinking. Clear thinking is really nothing more than sorting and arranging thoughts over and over until a logical structure appears. Brainstorm will help you do that.

Using Brainstorm requires no manual. You just follow the prompts. The REM statements in lines 35–100 reveal the process. First, you type in ideas. I encourage you to be very free in generating your ideas. Do *not* worry about correctness at this point. If, during the input stage, you fret about whether this parallels that or whether you're repeating yourself, you'll lose the right-brain flow. Just be loose and get onto that screen any idea that pops into your mind.

After you've exhausted your ideas, you'll enter the grouping stage. This is simply a presentation of your raw ideas, two at a time. Your task is to decide if the two presented seem similar. This simple comparison test is the beginning of rational thought. Again, don't worry if you made wrong decisions. You'll get a chance to correct them later.

From this point on, your ideas will be presented in groups that you have unwittingly constructed. It's pleasant to discover that your spontaneous ideas, compared only in pairs up to this point, are now grouped; the shadow of an underlying structure is becoming apparent.

You'll be given the chance to move items from group to group, juggle

RUN It Right

C-64; C-128 (in C-64 mode)
Printer required

3 2 1
0
3
π
Mahoney

KATHERINE MAHONEY

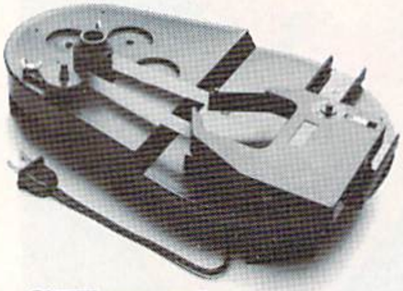
Circle 274 on Reader Service card.

The Universal MacInker(s)^(TM) are here

Re-ink any Fabric ribbon automatically for less than

5¢

Now one **Universal Cartridge MacInker (UC)** re-inks all fabric cartridges and one **Universal Spool MacInker (US)** re-inks all spools. We have **MacInker(s)** dedicated to specialized cartridges, zip pack, harmonica etc. Over 1000 printer brands supported. Use your **MacInker** to re-ink your dry, fabric cartridges (for less than 5 cents in ink) and watch the improvement in print-out quality. Our new, residue-less, lubricated, dot matrix ink yields a darker print than most new ribbons. Or get any of our basic ink colors: brown, blue, red, green, yellow, purple and use **MacInker** to **create and/or Re-ink your own colored cartridges.** We have uninked or colored cartridges for the popular printers and ribbon re-loads for any printer. Operation is extremely simple & automatic with new, twin drive electric motor that supports CW and CCW rotating cartridges. A good quality fabric ribbon of average length can be re-inked almost indefinitely. In our tests one re-inked Epson* 80 ribbon has outlived the estimated life of the print-head!! We receive consistent & similar feedback from our customers. As of August 85 we have over 40,000 MAC INKER(s) in the field, in 5 continents (220 V motors available). **MacInker (UC) is $60.00.** Cartridge drivers are **$8.50/ea.** We still have our first generation, dedicated **MacInker(s)** for most popular printers. Prices start at **$54.95** with most units below $60.00. **MacInker** has been reviewed, approved and flattered in most magazines and even in the NEW YORK TIMES and the CHICAGO SUN TIMES.



Computer Friends

6415 S.W. Canyon Ct.
Portland, OR 97221
(503) 297-2321

Order toll free 1-800-547-3303
or ask for free detailed brochure.
Dealers inquiries welcome.

*EPSON is a trademark of EPSON CORP.

THESIS: The DJN/R offers services to a broad cross-section of computer users.

- I. Dow Jones News/Retrieval—description
  - A. Describe Dow Jones News/Retrieval
  - B. What it is
  - C. Who it is targeted for
  - D. How to subscribe to the DJN/R
  - E. How much it costs

- II. Services available
  - A. What services it has
  - B. Financial and business news
  - C. CompuStore
  - D. Free services
  - E. Newsletter
  - F. MCI Mail

THESIS: DJN/R offers information services for a wide variety of topics.

- I. Describe DJN/R
  - A. What it is
    - 1. When it was developed
    - 2. Who it was made for originally
  - B. Who it is targeted for
    - 1. Traditionally for people in need of quick financial and business news
    - 2. Now includes a more general audience
  - C. How to subscribe to the DJN/R
    - 1. Phone call to 800 #
    - 2. On-line registration
  - D. How much it costs
    - 1. Rate for people with no product deal
    - 2. Rate for those with a modem or software offering discount deal

- II. Services available
  - A. Financial and business news
  - B. CompuStore
  - C. Free services
  - D. Newsletter
  - E. MCI Mail

Figure 1. *Example of an outline produced by the Brainstorm program.*

items within groups, assign headings, rearrange group order, rephrase headings, subdivide items, view a rough draft halfway through, write a thesis statement that sums up your entire idea or argument and, finally, print your outline.

The prompts will guide you nicely along, but several points bear emphasizing. Foremost, when in doubt, hit the return key. The worst that can happen is you'll jump prematurely into the next level, and you can always go back.

It is also important to use the buffer. Early in the program, you'll be able to extract items from groups and store them in a buffer. Use this feature to rearrange the order of your items, as well as to move items from group to group.

Also, several times in the program you'll be asked if you want to repeat the process. If in doubt, answer yes. It is during these repeat runs that many inconsistencies show up.

And finally, nothing beats practice. Once or twice through Brainstorm will make you an expert.

The end product of Brainstorm is an outline, and, to avoid confusion, you should be familiar with some of the conventions of outlines. First, there are two major types: topic and sentence. Brainstorm's format is geared more towards a topic outline, because it will not accept terminal punctuation within headings unless you enclose your inputs within quotation marks.

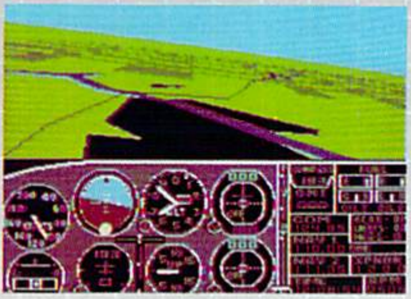
Next, good outlines are parallel in structure. This means that headings of equal value (such as all the uppercases within a group) should be similarly worded. Thus, if point A is "What Cows Eat" and point B is "Swill and other Pig Food," it would be better to make B "What Pigs Eat."

SCENERY DISKS *for* FLIGHT SIMULATOR II

SubLOGIC Scenery Disks expand the potential flying environment of Flight Simulator II and Microsoft Flight Simulator.

Twelve separate Scenery Disks cover the entire continental United States. Each disk covers a geographical region of the country, and includes the major airports, radio-nav aids, cities, highways, rivers, and lakes located in that region. Enough detail is available on each disk for either visual or instrument cross-country navigation.

A STAR Scenery Disk (available 4th quarter 1985) covers a smaller area with a relatively dense amount of scenery. STAR Scenery Disks are primarily intended for visual flight sight-seeing. They include buildings and landmarks, as well as detailed renditions of all major airports in the area.



Individual Scenery Disk price: $19.95
Western U.S. (Disks 1-6): $99.95
– Coming Soon –
Eastern U.S. (Disks 7-12): $99.95

See Your Dealer . . .
or write or call for more information. For direct orders please specify which disk or disk-set you want. Enclose the correct amount plus $2.00 for shipping ($6.00 for the six-disk set) and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

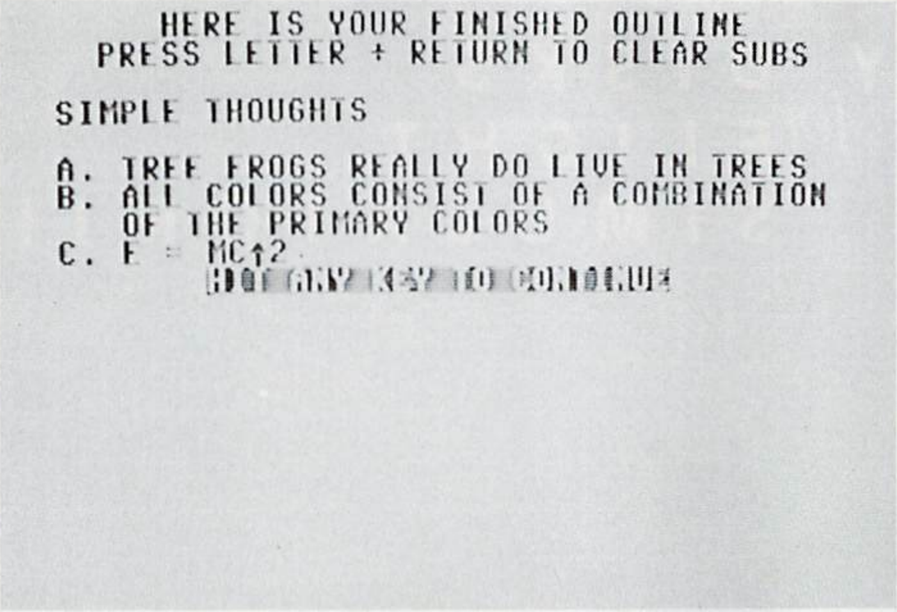
Commodore 64 is a trademark of Commodore Electronics Ltd.
IBM is a registered trademark of International Business Machines Corp.

For the Commodore 64™ and IBM PC®

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

Circle 40 on Reader Service card.



```
HERE IS YOUR FINISHED OUTLINE
PRESS LETTER + RETURN TO CLEAR SUBS

SIMPLE THOUGHTS

A. TREE FROGS REALLY DO LIVE IN TREES
B. ALL COLORS CONSIST OF A COMBINATION
   OF THE PRIMARY COLORS
C. E = MC↑2
      HIT ANY KEY TO CONTINUE
```

Lines 80–90 will guide you in this process.

A third outlining convention that Brainstorm obeys is the rule that you must never have an "A" without a "B" or a "1" without a "2." The subroutine denoted in line 55 follows this rule for the major headings.

Brainstorm's final outlining rule limits you to seven major headings, because an outline with more than seven headings is awkward, difficult to follow and should be condensed.

I've also discovered that Brainstorm doesn't have to quit when the writing process moves into the writing stage. After the initial brainstorming session, I print up my outline and start writing, using it as my guide. Then, as I write, I often discover that my outline could use a little rearranging or some additional points. So, when it feels right, I reload Brainstorm and start again, using my previous outline as a guide. This is extremely helpful in achieving extra-solid logic.

Braving the Storm

I must report a few potential perils associated with Brainstorming. This program uses a lot of Input statements, and there are three tricks to keep in mind when typing in inputs: 1. As previously mentioned, if you wish to include punctuation within the input, enclose your input within quotation marks; 2. Keep your cursor on the line it's already on, as moving it can cause problems (it's okay, however, to type onto the next line or move the cursor within the line); 3. Always end your response by pressing the return key.

Another snare concerns Brainstorm's limitations. First of all, you can't input more than 40 raw ideas. (You could have more by changing G in line 30 to whatever you wish, but doing so slows down the program and I feel it's unlikely you'll ever need more.) Secondly, you can't have more than 15 items within a single group. (Again, you can opt for more by changing LC(15) in line 30 to LC(whatever), but the same advice applies.) Finally, the C-64's somewhat sluggish garbage collection routine; occasionally the program will hang up for ten or 20 seconds or more. Don't panic. Eventually it will be all right.

The only other known quirk relates to the fact that your screen is only showing a 40-column page, while your printer will print in 80 columns. Therefore, when you type long items, a few words might jump down a line and mess up your screen display. Don't worry, however, because everything will look fine on your printout.

I included a string-printing trick in lines 15–20 and in line 975. By defining a string at the top of the program (L$ and SP$) as a series of cursor movements and spaces, then by using the Left$ command with a variable, I was able to do some nifty screen formatting. I suggest you fool around with this technique, as it's a good one.

I wrote this article with a Brainstormed outline before me. The program works well, I assure you. Type it in and try it; you'll love it!

For those who prefer not to type in Brainstorm, send me $3 and a blank cassette or formatted disk with a self-addressed stamped mailer, and I'll send you a copy of the program. R

Address all author correspondence to Mark Jordan, 70284 C.R. 143, Ligonier, IN 46767.

Listing 1. *Brainstorm program.*

```
10 POKE53280,1:POKE53281,1:PRINT"{COMD 3}"
                                   :REM*252
15 DIMZ$(48),D$(11,11):L$="{HOME}{22 CRSR D
   Ns}":LS$="{10 CRSR RTs}"        :REM*115
20 SP$="{40 SPACEs}":DI$="HEADINGS" :REM*12
25 FORT=1TO7:READR$(T):NEXT:FORT=1TO48:READ
   Z$(T):NEXT                        :REM*5
30 N1=18:N2=62:N3=146:G=40:R=1:FT=G:B=0:DIM
   I$(G),ID$(10,G,10),LC(15)       :REM*200
35 GOSUB160 :REM{3 SPACEs}INPUT IDEAS
                                   :REM*129
40 GOSUB180 :REM{3 SPACEs}GROUP IDEAS
                                   :REM*104
45 GOSUB265 :REM{3 SPACEs}REMOVE IDEAS
                                   :REM*121
50 GOSUB310 :REM{3 SPACEs}REPLACE BUFFERED
   ITEMS                            :REM*58
55 GOSUB615 :REM{3 SPACEs}CHECK FOR A WITHO
   UT B                            :REM*149
60 GOSUB405 :REM{3 SPACEs}HEADINGS :REM*232
65 GOSUB750 :REM{3 SPACEs}REARRANGE HEADING
   S                               :REM*203
70 GOSUB435 :REM{3 SPACEs}THESIS STATEMENT
                                   :REM*124
75 GOSUB450 :REM{3 SPACEs}ROUGH DRAFT
                                   :REM*129
80 GOSUB495 :REM{3 SPACEs}PICK BEST-WORDED
   ITEM                             :REM*46
85 GOSUB535 :REM{3 SPACEs}REPHRASE HEADINGS
                                    :REM*93
90 GOSUB570 :REM{3 SPACEs}REPHRASE SUB HEAD
   INGS                            :REM*212
95 GOSUB685 :REM{3 SPACEs}SUBDIVIDE SUBHEAD
   INGS                             :REM*83
100 GOSUB855:REM{3 SPACEs}FINAL CHECK THEN
    PRINT                          :REM*170
105 GOTO45                         :REM*133
110 C=64:LIMIT=LC(U)               :REM*158
115 IFLC(U)=0THENLIMIT=R            :REM*73
120 FORP=1TOLIMIT:F=1              :REM*254
```

→

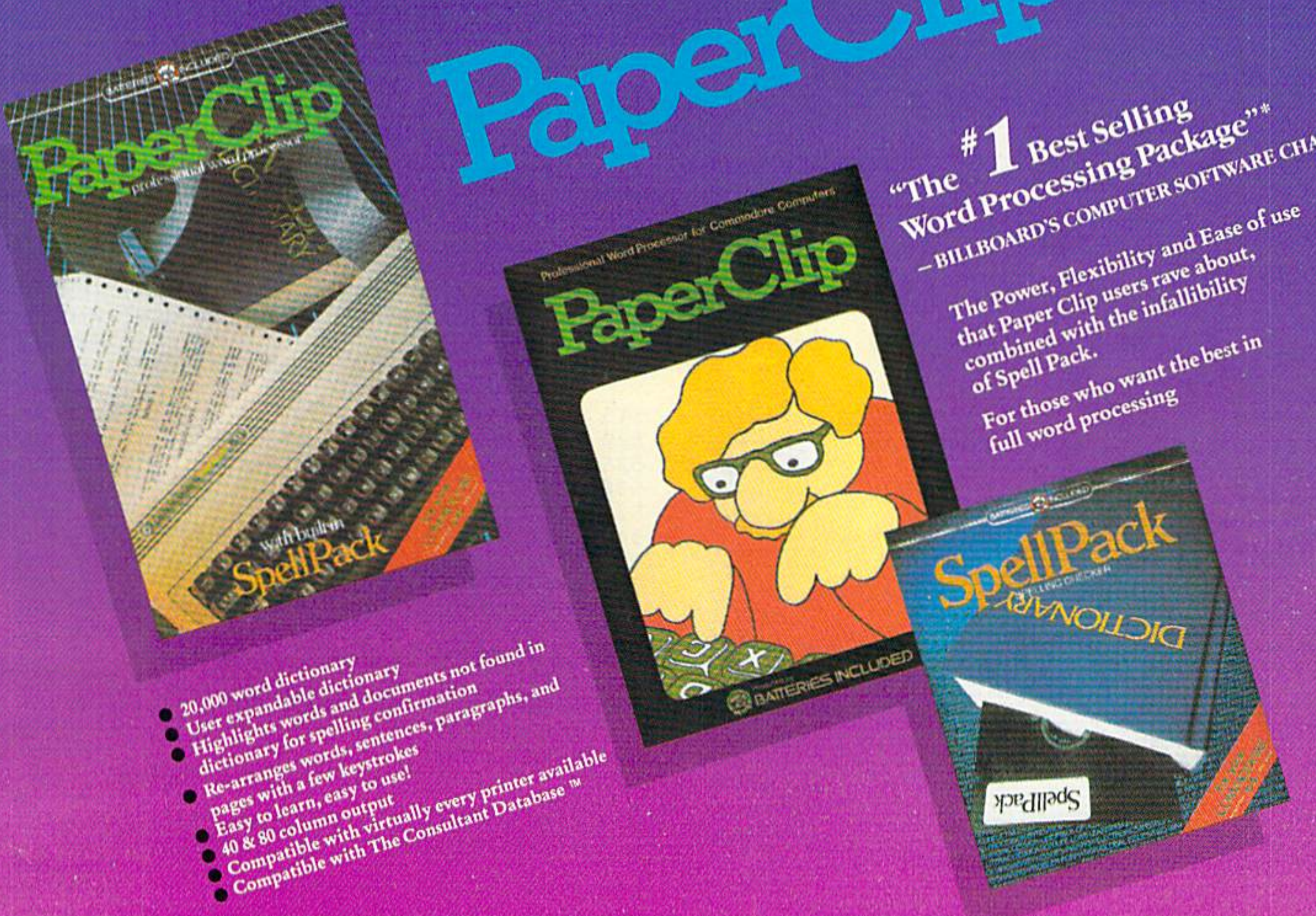
NEW
C-128 ENHANCED
VERSION

"... facts attest to its
EXCELLENCE!"

*"So far as we are concerned,
Paper Clip is the top word processor
running on a micro computer."*
—Home Applications For The C-64

*"Paper Clip is one of the easiest
of the professional word processors to use,
with a sensible manual and plenty of aids for the accident-prone."*
—Computing Now

PaperClip™


BATTERIES INCLUDED
PaperClip
professional word processor
with built-in
SpellPack
Professional Word Processor for Commodore Computers
PaperClip
BATTERIES INCLUDED
BATTERIES INCLUDED
SpellPack
SPELLING CHECKER
DICTIONARY
SpellPack

"The #1 Best Selling
Word Processing Package"*
—BILLBOARD'S COMPUTER SOFTWARE CHARTS!

The Power, Flexibility and Ease of use
that Paper Clip users rave about,
combined with the infallibility
of Spell Pack.

For those who want the best in
full word processing

- 20,000 word dictionary
- User expandable dictionary
- Highlights words and documents not found in dictionary for spelling confirmation
- Re-arranges words, sentences, paragraphs, and pages with a few keystrokes
- Easy to learn, easy to use!
- 40 & 80 column output
- Compatible with virtually every printer available
- Compatible with The Consultant Database™

FROM CLAY TABLETS, THROUGH PARCHMENT, GUTENBERG AND BEYOND, MAN HAS SEARCHED FOR THE ULTIMATE METHOD TO STORE, SORT AND PRINT THE WRITTEN WORD. NOW, BATTERIES INCLUDED PROVIDES THAT METHOD, THE PAPER CLIP FAMILY. AN OUTSTANDING WORD PROCESSOR AND SPELLING CORRECTION SYSTEM FOR ALL COMMODORE COMPUTERS — AND COMING SOON FOR APPLE AND ATARI.

BATTERIES INCLUDED

"The Energized Software Company!"

30 Mural Street
Richmond Hill, Ontario
L4B 1B5 CANADA
(416) 881-9941
Telex: 06-21-8290

17875 Sky Park North, Suite P
Irving, California
USA 92714
(416) 881-9816
Telex: 509-139

WRITE TO US FOR FULL COLOUR CATALOGUE of our products for COMMODORE, ATARI, APPLE and IBM SYSTEMS

FOR TECHNICAL SUPPORT OR PRODUCT INFORMATION PLEASE PHONE (416) 881-9816
*As compiled from National Retail Store Sales Reports for week ending January 5, 1985

© 1985 BATTERIES INCLUDED. APPLE, ATARI, COMMODORE AND IBM ARE REGISTERED TRADEMARKS RESPECTIVELY OF APPLE COMPUTERS INC., ATARI INC., COMMODORE BUSINESS MACHINES INC., AND IBM BUSINESS MACHINES INC.

Listing 1 continued.

```
125 IFID$(U,P,0)=""THENFORI=P+1TOLI+1:ID$(U
    ,I-1,0)=ID$(U,I,0):NEXT            :REM*83
130 IFID$(U,P,0)=""THEN150             :REM*86
135 C=C+1:PRINTLEFT$(LS$,0)CHR$(C)CHR$(N1)C
    HR$(N2)CHR$(N3)ID$(U,P,0)          :REM*41
140 IFID$(U,P,F)<>""THENPRINTLEFT$(LS$,2)F"
    {CRSR LF}. "ID$(U,P,F):F=F+1:GOTO140
                                       :REM*84
145 NEXT                              :REM*155
150 LC(U)=P-1:IFLC(U)>HITHENHI=LC(U):REM*26
155 RETURN                            :REM*213
160 Z=1:GOSUB945:Z=2:GOSUB955:Z=4:GOSUB955
                                       :REM*10
165 N=14:GOSUB975                     :REM*223
170 INPUT"{2 CRSR UPs}";I$(R):IFI$(R)=""THE
    NRETURN                           :REM*202
175 R=R+1:GOSUB735:GOTO165             :REM*91
180 UC=0:Z=5:GOSUB945:Z=6:GOSUB955:Z=7:GOSU
    B950:Z=9:GOSUB950                  :REM*32
185 Z=10:GOSUB950:Z=11:GOSUB950        :REM*37
190 D=1:C=1:UC=UC+1                    :REM*48
195 IFI$(D)=""THEND=D+1:IFD<GTHEN195:REM*39
200 ID$(UC,1,0)=I$(D):N=12:GOSUB975:PRINT"{
    2 CRSR UPs}"I$(D):I$(D)=""        :REM*136
205 FORT=D+1TOR                       :REM*179
210 IFI$(T)=""THEN250                 :REM*206
215 N=15:GOSUB975:PRINT"{2 CRSR UPs}"I$(T)
                                      :REM*255
220 GETA$:IFA$="Y"THEN235             :REM*198
225 IFA$="N"THEN245                   :REM*145
230 GOTO220                           :REM*200
235 C=C+1:ID$(UC,C,0)=I$(T):I$(T)=""
                                      :REM*161
240 IFC>14THENZ=40:GOSUB960:FORT=1TO1000:NE
    XT:GOTO255                         :REM*60
245 N=14:GOSUB975                      :REM*47
250 NEXT                                :REM*4
255 FORK=DTOR:IFI$(K)<>""THEN190       :REM*21
260 NEXT:RETURN                       :REM*201
265 U=0:B=1                            :REM*94
270 U=U+1:IFU=UC+1THENRETURN          :REM*243
275 Z=0:Z$(0)=Z$(14)+STR$(U):GOSUB945:GOSUB
    110                               :REM*100
280 Z=15:GOSUB955:Z=16:GOSUB950:Z=12:GOSUB9
    50                                 :REM*37
285 GETA$:A=ASC(A$+CHR$(0))            :REM*96
290 IFA=13THEN270                     :REM*173
295 IFA<65ORA>CTHEN285                :REM*116
300 ID$(UC+1,B,0)=ID$(U,A-64,0):B=B+1:LC(UC
    +1)=LC(UC+1)+1                    :REM*189
305 ID$(U,A-64,0)="":ID$(U,A-64,1)="":GOTO2
    75                                 :REM*16
310 UU=1                              :REM*137
315 IFB$="+"THENRETURN                :REM*222
320 U=UC+1:Z=19:GOSUB945:GOSUB110:CC=C
                                       :REM*79
325 Z=0:Z$(0)=Z$(14)+STR$(UU):GOSUB955
                                      :REM*108
330 U=UU:GOSUB110:Z$(0)=Z$(20)+STR$(U):GOSU
    B955:Z=16:GOSUB950:Z=3:GOSUB955:REM*245
335 GETA$:A=ASC(A$+CHR$(0))           :REM*146
340 IFA=13THEN370                     :REM*225
345 IFA=136THEN365                     :REM*92
350 IFA=45THENID$(UU,1,0)="":RETURN:REM*181
355 IFA<65ORA>CCTHEN335                :REM*88
360 ID$(UU,P,0)=ID$(UC+1,A-64,0):ID$(UC+1,A
    -64,0)="":LC(U)=LC(U)+1:GOTO315:REM*191
365 INPUT"{2 CRSR DNs}";I$:ID$(UU,P,0)=I$:R
    =R+1:LC(U)=LC(U)+1:GOSUB735:GOTO315
                                      :REM*182
370 UU=UU+1:IFUU<>UC+1THEN315         :REM*153
375 Z=21:GOSUB945:Z=22:GOSUB950:Z=47:GOSUB9
    70                                :REM*156
380 FORT=1TOLC(UC+1):ID$(UC+1,T,0)="":NEXT
                                      :REM*111
385 GETA$:IFA$=""THEN385              :REM*202
390 IFA$="{LEFT ARROW}"THEN45         :REM*123
395 IFA$="+"THENU=UC:UC=UC+1:GOTO315
                                      :REM*116
400 RETURN                            :REM*203
405 FORT=1TOLC(UC+1):ID$(UC+1,T,0)="":NEXT:
    Z=23:GOSUB945:U=1                 :REM*170
410 Z=0:Z$(Z)=Z$(28)+STR$(U):GOSUB955:PRINT
    :GOSUB110                         :REM*223
415 INPUT"{CRSR DN}HEADING";ID$(U,0,0)
                                      :REM*116
420 IFID$(U,0,0)=""THENID$(U,0,0)="(NO HEAD
    ING)"                             :REM*165
425 U=U+1:IFU=UC+1THENRETURN          :REM*142
430 GOTO410                           :REM*145
435 Z=46:GOSUB945:Z=45:GOSUB950       :REM*230
440 INPUT"{2 CRSR DNs}";THESIS$:IFTH$=""THE
    NTH$=T$                            :REM*13
445 T$=TH$:RETURN                     :REM*100
450 Z=25:GOSUB945                      :REM*87
455 Z=0:Z$(Z)=TH$:GOSUB955            :REM*200
460 U=1:N1=27:N2=46:N3=32             :REM*145
465 PRINT"{CRSR DN}"ID$(U,0,0)"{CRSR DN}":G
    OSUB110                           :REM*106
470 U=U+1                             :REM*187
475 Z=35:GOSUB965                     :REM*132
480 GETA$:IFA$=""THEN480              :REM*199
485 IFU=UC+1THENRETURN                :REM*118
490 GOTO465                           :REM*189
495 E=0                               :REM*160
500 Z$(0)=Z$(8)+" "+DI$:Z=0:GOSUB945:Z=27:G
    OSUB950:Z=44:FT=42:GOSUB955        :REM*49
505 IFDI$="ITEMS"THENE=E+1:U=E:PRINT"{CRSR
    DN}"ID$(E,0,0)"{CRSR DN}":GOSUB110:GOTO
    515                                :REM*10
510 FORU=1TOUC:PRINT"{CRSR DN}"CHR$(U+64)".
     "ID$(U,0,0):NEXT                  :REM*91
515 GETA$:IFA$=""THEN515              :REM*203
520 IFA$=CHR$(13)THENA=0:GOTO530       :REM*48
525 A=ASC(A$)-64:IFA<0THENA=0         :REM*219
530 RETURN                             :REM*78
535 IFA=0THENRETURN                   :REM*181
540 Z=31:GOSUB945:Z=32:GOSUB950:PRINT:Z=0:Z
    $(Z)=ID$(A,0,0)+" ":GOSUB965      :REM*190
545 Z=44:FT=42:GOSUB955                :REM*47
550 FORY=1TOUC:IFID$(A,0,0)=ID$(Y,0,0)THEN5
    65                                :REM*212
555 N=12:GOSUB975:PRINT"{2 CRSR UPs}"ID$(Y,
    0,0)                              :REM*237
560 INPUT"{CRSR DN}CHANGE TO";ID$(Y,0,0):N=
    15:GOSUB975                       :REM*210
565 NEXT:RETURN                       :REM*251
570 DI$="ITEMS":GOSUB500:IFA=0THEN605
                                      :REM*250
575 Z=24:GOSUB945:Z=32:GOSUB950:PRINT:Z=0:Z
    $(Z)="{CTRL 9}"+ID$(E,A,0):GOSUB965
                                      :REM*203
580 Z=44:FT=42:GOSUB955                :REM*82
585 FORY=1TOP-1:IFID$(E,A,0)=ID$(E,Y,0)THEN
    600                                :REM*11
590 N=12:GOSUB975:PRINT"{2 CRSR UPs}"ID$(E,
    Y,0)                               :REM*32
595 INPUT"{CRSR DN}CHANGE TO";ID$(E,Y,0):N=
    15:GOSUB975                       :REM*253
600 NEXT                              :REM*100
605 IFE=UCTHENRETURN                  :REM*191
610 GOTO570                           :REM*174
615 U=0:N=0                           :REM*191
620 U=U+1:IFU>UCTHENRETURN            :REM*226
625 IFID$(U,1,0)=""THEN665             :REM*63
630 IFID$(U,2,0)=""THEN640             :REM*22
635 GOTO620                           :REM*127
640 Z=34:GOSUB945:Z=0:Z$(Z)=Z$(28)+STR$(U)+
    " "+Z$(36):GOSUB955               :REM*156
645 Z=37:GOSUB955:Z=38:GOSUB955:GOSUB110
                                       :REM*49
650 GETB$:IFB$="{LEFT ARROW}"THEN665
                                      :REM*180
```

→

Circle 209 on Reader Service card.

ORDERS ONLY...CALL TOLL FREE
1-800-468-9044
INFORMATION & PA ORDERS 814-234-2236
EXTENDED HOLIDAY HOURS: NOV 24-DEC 25; 9-10 M-F, 10-6 S-SUN
REGULAR HOURS: 9-8 Mon-Fri, 10-5 SAT EAST COAST TIME

HOLIDAY SPECIALS

NEW PRODUCTS! NEW LOWER PRICES! MANY PACKAGE DEALS!

FAST DEPENDABLE SERVICE — Your order on in stock items is shipped UPS ground the next business day. UPS 2nd day and next day air available.

"If we don't have the lowest price — give us a chance to beat it."

NOW IN STOCK CALL FOR LATEST PRICES!

COMMODORE 128

1571, 1572 disk drives, 1902 monitor, 1670 modem, & Software for the C128

PACKAGE DEALS AVAILABLE
ON C128 AND DISK DRIVES CALL FOR DETAILS

CLOSEOUT PRICES ON C64, 1541, and 1702 PACKAGES
MPS-801 PRINTER $106.95

COMMODORE 128 SOFTWARE

WORDPRO 128 from Proline. Written by Steve Punter, author of best sellers Wordpro 3 + /64, Wordpro 64. Uses 80 columns, fast drives!
list $99.95 ..... **OUR PRICE $89.95**

JANE	$32.95
Perfect Calc	$42.95
Perfect Writer	$CALL
Perfect Filer	$CALL
Vizastar 128	$CALL

PRO·LINE SOFTWARE

GT 4, fast load/fast save/disk basic/cartridge for C-64	$29.95
C POWER C COMPILER	$69.99
CADPIC	$36.95
CASHBOX	$36.95
Wordpro 64	$36.95
Spellpro 64	$32.95
Mailpro 64	$24.95
Profile 64	$36.95
PAL 64	$32.95
POWER 64	$32.95
TOOLBOX 64	$69.95

MONTHLY SPECIALS

PRICES EXPIRE 12/31/85

Indus GT	$199.00
Vizastar 8K	$ 79.95
Compuserve Starter Kit	$ 19.95
Amaray Mediamate 5 or Innovative Concepts DataCase each holds 50 disks Your choice	$9.95 EACH

DISKOUNT DISKS!!

Bonus Disks (10)
SS/dd .. **$9.95** dd/dd .. $12.95
Maxell (10)
ss/dd .. **$13.95** dd/dd .. $CALL
Centech colored disks (10)
ss/dd .. **$9.45** dd/dd .. $11.95
other brands available .... CALL

xetec inc.

SUPER GRAPHIX printer interface w/8K buffer, and down loadable character fonts. Simply the best interface made ..... $ lowest price

SUPERGRAPHIX jr printer interface	$46.95
FONT MASTER	$24.95

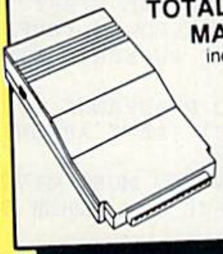
RGBi/Composite Monitors Alternatives to the 1902

Technica MJ-22	$269.00
Panasonic 1300	$CALL
RGBi Cable	$19.95
Composite Video Cable	$6.95

The Print Shop

Broderbund Print Shop	$25.95
Graphics Library I or II	$16.95
120 sheet color paper refill ⅓ red, ⅓ blue, ⅓ gold	$8.95

MODEMS — MODEMS — MODEMS



TOTAL TELEMODEM	$29.95
MASTER MODEM includes Compuserve, Dow Jones time	$39.95
1660	$49.95
WESTRIDGE AUTO	$59.95
MITEY MO	$59.95
MPP 1064	$64.95
VIP TERMINAL	$29.95
VIDTEX TERMINAL	$23.95
COMPUSERVE STARTER KIT	$19.95

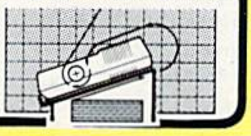
MIRAGE CONCEPTS

Database Manager with Report Generator	$36.99
Prof. Wordprocessor	$36.99
Database Manager, Prof. WP Package	$67.95

- ★ All items new and factory sealed
- ★ Buy with confidence, we honor manufacturer's warranty
- ★ Qualified corporate and educational purchase orders accepted
- ★ We accept VISA, MasterCard, COD, and Money Orders.

KENSINGTON

STAND	$19.95
w/any printer	$14.95



MONITOR MADNESS

SAKATA SC100 13" COLOR	$149.00
Zenith 12" Amber	$ 77.95
Zenith 12" Green	$ 77.95
NEC 12" Green	$ 69.95
Cable for monitors	$ 6.95

PRINTER PACKAGE MANIA!

all packages work with C64 or C128

star

SG-10 & XETEC SUPERGRAPHIX	$274.95
SG-10 & Xetec Supergraphix jr	$254.95
SG-10 & Cardco G-Wiz	$264.96
SG-10 & MW-350	$275.95
SG-15 & Xetec Supergraphix	$419.95
SG-15 & Cardco G-Wiz	$412.95
SD-10 & Xetec Supergraphix	$384.95

PANASONIC

1091 & Xetec Supergraphix	$289.95
1091 & Cardco G-Wiz	$285.95

EPSON 1

LX-80 & Xetec Supergraphix	$274.95
LX-80 & Cardco G-Wiz	$269.95
FX-85 & Xetec Supergraphix	$387.95
FX-185 & Xetec Supergraphix	$529.95

star micronics·inc

SG-10	$CALL
SG-10C Commodore ready	$236
SG-15	$364
SD-10	$323
SD-15	$449
POWERTYPE 18cps daisywheel	$299
SR-10, SR-15	$CALL

EPSON 1

LX-80	$219.00
LX-80 tractorfeed	$ 34.95
Homewriter 10 includes Commodore or Atari interface	$246.95
FX-85	$323.95
FX-185	$469.00

HUSH 80 CD $74.95

Commodore ready thermal printer

PANASONIC

1091	$229.00
1090	$186.95
1092	$349.00
1093	$CALL

LETTER QUALITY PRINTERS when near letter quality isn't good enough

Cardco LQI	$249
Riteman LQ	$239
Epson DX-10	$229
Epson DX-20	$309
Star Powertype	$299

PRINTER INTERFACES

Cardco ?/G	$47.95
Cardco G Wiz	$CALL
Tymac Connection	$67.95
MW-350	$CALL
MW-350 buffer	$20.00
Grapler CD	$87.95

To order by mail: Send money order, certified check, personal check. Allow 2 weeks for personal check to clear.

Shipping: $2.50 for software and accessories/$10.00 for printers and color monitors/$8.00 for disk drives and other monitors/ Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI, and foreign orders.

Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 3% **FOR MASTERCARD OR VISA.** Manufacturer's warranty honored with copy of our invoice. **ALL SALES ARE FINAL.** Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

TUSSEY COMPUTER PRODUCTS

P.O. BOX 1006
STATE COLLEGE, PA 16804

Listing 1 continued.

```
655 IFB$="+"THENUU=U:K=U:LC(U)=LC(U)+1:GOSU
    B325:U=K:GOTO620                     :REM*231
660 GOTO650                              :REM*200
665 M=U                                  :REM*189
670 FORT=1TOHI:ID$(M,T,0)=ID$(M+1,T,0):ID$(
    M+1,T,0)="":NEXT                     :REM*212
675 LC(M)=LC(M+1):M=M+1:IFM=>UCTHENUC=UC-1:
    GOTO620                              :REM*143
680 GOTO670                              :REM*252
685 U=1                                  :REM*175
690 Z=39:GOSUB945:PRINT"{CRSR UP}";:Z=43:GO
    SUB950:Z=44:FT=42:GOSUB955            :REM*12
695 E=0:PRINT"{CRSR DN}"ID$(U,0,0)"{CRSR DN
    }":GOSUB110                           :REM*45
700 GETA$:A=ASC(A$+CHR$(0)):IFA=13THEN725
                                          :REM*28
705 IFA<65ORA>P+64THEN700                :REM*225
710 PRINT"{CRSR DN}"ID$(U,A-64,0)"{CRSR DN}
                                         :REM*188
715 E=E+1:INPUTI$:IFI$=""THENID$(U,A-64,E)=
    "":GOTO690                           :REM*233
720 ID$(U,A-64,E)=I$:I$="":GOTO715 :REM*238
725 IFU<UCTHENU=U+1:GOTO690               :REM*21
730 RETURN                                :REM*22
735 IFR<35THEN745                        :REM*217
740 PRINT"{CTRL 9}{2 SPACEs}WARNING:{2 SPAC
    Es}ONLY "G-R"{CRSR LF}{2 SPACEs}MORE ID
    EAS ALLOWED {2 CRSR UPs}":FORS=1TO2000:
    NEXT                                  :REM*68
745 RETURN                                :REM*37
750 U=1:ZZ=18                            :REM*240
755 Z=13:GOSUB945:Z=17:GOSUB955:Z=12:GOSUB9
    50                                   :REM*143
760 GETA$:IFA$="{LEFT ARROW}"THEN775:REM*88
765 IFA$<>""THEN850                      :REM*109
770 GOTO760                               :REM*79
775 FORT=1TOUC:PRINTT" - "ID$(T,0,0):NEXT
                                          :REM*92
780 Z=ZZ:GOSUB955:ZZ=29                  :REM*145
785 GETA$:A=(ASC(A$+CHR$(0)))-48:IFA$=""THE
    N785                                 :REM*116
790 IFA<1ORA>9THEN785                     :REM*37
795 IFU<=UCANDID$(A,0,0)=""THEN785        :REM*24
800 X$(U)=ID$(A,0,0):ID$(A,0,0)=""        :REM*61
805 FORT=1TOLC(A):D$(U,T)=ID$(A,T,0):W=1
                                          :REM*18
810 IFID$(A,T,W)<>""THENY$(U,T,W)=ID$(A,T,W
    ):W=W+1:GOTO810                      :REM*233
815 NEXT:L(U)=LC(A):ID$(U,T,0)=""         :REM*56
820 U=U+1:IFU>UCTHEN830                  :REM*223
825 FORT=1TOU:PRINTX$(T):NEXT:PRINT"{2 CRSR
     DNs}":GOTO775                        :REM*54
830 U=1:FORT=1TOUC:ID$(T,0,0)=X$(T):X$(T)="
    ":LC(T)=L(T):NEXT                    :REM*235
835 FORT=1TOL(U):ID$(U,T,0)=D$(U,T):W=1:ID$
    (U,T,1)=""                           :REM*144
840 IFY$(U,T,W)<>""THENID$(U,T,W)=Y$(U,T,W)
    :W=W+1:GOTO840                        :REM*91
845 NEXT:ID$(U,T-1,W)="":U=U+1:IFU<=UCTHEN8
    35                                     :REM*6
850 RETURN                               :REM*143
855 Z=26:GOSUB945:Z=43:GOSUB950          :REM*108
860 GOSUB460:PRINT"{2 CRSR DNs}":Z=21:GOSUB
    970:Z=42:GOSUB970:Z=41:GOSUB950 :REM*13
865 GETB$:IFB$="{LEFT ARROW}"THENDI$="HEADI
    NGS":RETURN                          :REM*154
870 IFB$="P"THEN880                        :REM*9
875 GOTO865                               :REM*96
880 OPEN3,4:CMD3                          :REM*99
885 A=1:B=1:PRINT"THESIS:{2 SPACEs}"TH$:PRI
    NT:PRINT                             :REM*136
890 C=1:PRINTR$(A)"{2 SPACEs}"ID$(A,0,0):PR
    INT                                  :REM*167
895 PRINT"{6 SPACEs}"CHR$(B+64)".{2 SPACEs}
    "ID$(A,B,0):PRINT                    :REM*232
900 IFID$(A,B,C)=""THEN910               :REM*205
905 PRINT,CHR$(C+48)".{2 SPACEs}"ID$(A,B,C)
    :C=C+1:GOTO900                        :REM*96
910 IFC>1THENPRINT:C=1                   :REM*229
915 B=B+1:IFID$(A,B,0)<>""THEN895         :REM*76
920 A=A+1:B=1:IFID$(A,B,0)<>""THENPRINT:GOT
    O890                                  :REM*93
925 PRINT#3,:CLOSE3:Z=48:GOSUB945         :REM*44
930 GETA$:IFA$="Y"THENRETURN             :REM*215
935 IFA$="N"THENEND                      :REM*158
940 GOTO930                              :REM*217
945 PRINT"{SHFT CLR}";                   :REM*120
950 L=FT-(LEN(Z$(Z))):FORT=1TOL/2:PRINT" ";
    :NEXT:PRINTZ$(Z):FT=40:RETURN        :REM*205
955 PRINT"{CRSR DN}";:GOTO950            :REM*202
960 PRINT"{CTRL 9}";:GOTO950             :REM*223
965 Z$(Z)="{CTRL 9}"+Z$(Z):GOTO950        :REM*52
970 FT=42:GOTO950                         :REM*55
975 PRINTLEFT$(L$,N)SP$+SP$;:RETURN:REM*164
980 DATA "{2 SPACEs}I."," II.","III."," IV.
    ","{2 SPACEs}V."," VI.","VII." :REM*169
985 DATA"{CTRL 9} BRAINSTORM ",TYPE ANY IDE
    A THAT COMES TO MIND                 :REM*230
990 DATA "TO ADD AN ITEM TYPE {CTRL 9} F-7
    "                                    :REM*109
995 DATA BUT LIMIT EACH TO TWO SCREEN LINES
    ,NOW YOU MUST GROUP YOUR IDEAS        :REM*88
1000 DATA THE COMPUTER WILL PRESENT THEM,TW
    O AT A TIME,NEXT REPHRASE YOUR:REM*171
1005 DATA IF YOU AGREE THAT THE TWO ARE SIM
    ILAR,"PRESS {CTRL 9} Y {CTRL 0}"
                                         :REM*166
1010 DATA "IF NOT, PRESS {CTRL 9} N {CTRL 0
    }","OTHERWISE PRESS {CTRL 9} RETURN ",
    TO RESEQUENCE                         :REM*95
1015 DATA HERE IS GROUP,TO REMOVE ANY ITEMS
     FROM THIS GROUP,TYPE ITS LETTER
                                         :REM*214
1020 DATA "TYPE {CTRL 9} {LEFT ARROW} {CTRL
     0}",WHICH ONE FIRST?                :REM*173
1025 DATA YOU REMOVED (BUFFERED) THESE ITEM
    S,TO MOVE BUFFERED ITEMS TO GROUP
                                         :REM*249
1030 DATA "TO REARRANGE GROUPS FURTHER TYPE
     {CTRL 9} {LEFT ARROW} ",OTHERWISE HIT
     ANY KEY                              :REM*96
1035 DATA NOW YOU MUST GIVE EACH GROUP A HE
    ADING,MAKE THE OTHER SUBHEADINGS
                                          :REM*53
1040 DATA HERE IS A ROUGH-DRAFT OF YOUR OUT
    LINE,HERE IS YOUR FINISHED OUTLINE
                                          :REM*60
1045 DATA TYPE THE LETTER OF YOUR BEST-WORD
    ED ONE,GROUP,WHICH ONE NEXT?,  :REM*45
1050 DATA NOW TRY TO MAKE EACH OTHER HEADIN
    G,PARALLEL TO THIS ONE,             :REM*82
1055 DATA EACH GROUP MUST HAVE A 'B' FOR EA
    CH 'A',HIT ANY KEY TO CONTINUE:REM*209
1060 DATA LACKS ONE,"TO ADD ONE TYPE {CTRL
    9} + ","TO DELETE TYPE{2 SPACEs}{CTRL
    9} {LEFT ARROW} "                    :REM*146
1065 DATA "{CRSR LF}TO SUBDIVIDE TYPE THE L
    ETTER OF THE ITEM"                   :REM*229
1070 DATA THIS GROUP FULL - NO MORE ITEMS A
    LLOWED,(TURN ON PRINTER)             :REM*236
1075 DATA "PRESS {CTRL 9} P {CTRL 0} TO PRI
    NT IT",PRESS LETTER + RETURN TO CLEAR
    SUBS                                 :REM*215
1080 DATA "(PRESS {CTRL 9} RETURN {CTRL 0}
    TO LEAVE UNCHANGED)",THAT SUMS{2 SPACE
    s}UP YOUR IDEA                       :REM*226
1085 DATA NOW TYPE ONE SENTENCE,"PRESS {CTR
    L 9} + {CTRL 0} TO ADD A NEW GROUP",RE
    VISE?{2 SPACEs}Y/N                   :REM*211
```

Circle 171 on Reader Service card.

FAST DELIVERY

Call Us For
Fast Service, Experience
and Affordable Prices

Software

Holiday Special

Stunt Flyer	$21.95
Acro Jet	$24.94

SUBLOGIC

Flight Simulator	$31.95
Microprose F-15 Eagle	$21.50
Solo Flight	$21.50
Jet Simulator	$29
Kennedy Approach	$21.50

EPYX
Fast Load
CARTRIDGE

FAST LOAD
$19.95

WORD PROCESSING

Special of the Month
FLEET SYSTEM 2
Great Buy $48

Special of the Month

Paper Clip	$49
Paper Clip/Speller	$64
Home Pak	$33

BEST SELLERS

1. Summer Games	$25
2. HitchHikers Guide	$23
3. Typing Tutor III	$25
4. Karateka	$19
5. Mind Prober	$25
6. Spell It	$37
7. S'more Basic Rom	$49.95
8. Sargon III	$32
9. Decision in Desert	$25
10. Home Accountant	$42

DATA BASES

PFS: File	$39
Super Base 64	$48

Special of the Month
The Consultant
$49

SPREAD SHEET

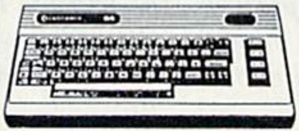
Multiplan	$59
Homepak	$34

Hardware

In Stock

C-128	$297
1571 Disk Drive	$259
1902 Monitor	$309

Holiday Special
C-128 Computer & 1571 Disk Drive
$549 GREAT BUY!



Commodore 64	$139
1530 Datasette	$39
1541 Disk Drive	$174
1660 Auto Modem	$52
1702 Color Monitor	$164

C-1902 Monitor
$299

Special of the Month
MSD DISK DRIVE

SD1 Disk Drive	$209
SD2 Disk Drive	$439

INDUS GT DISK DRIVE
$219

COMPUSERVE STARTER KIT $21

Great Gift
1541 FLASH
$54.95

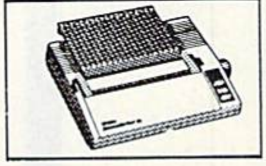
CARDCO 5 SLOT EXPANDER
$49.95

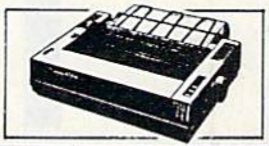
Printers

SG-10	$209
SG-10C	$229
SG-15	$359
SD-10	$329
SD-15	$444
SR-10	$479
SR-15	$579
Gemini 10x Ribbon	$3

star

RX-80	$218
Homewriter 10	$209
NEW LX-80	$210
FX-85	$329
FX-185	$459
DX-10 Daisywheel	$245





PANASONIC

1091	$232
1090	$185
1092	$374
1093	$425

Okidata 182	$214
Okidata 192	$349
Okidata 193	$499

MPS 801 Printer
$119 Reg. $199

SMITH CORONA
Fastext
80 Dot
Matrix
Printer
$149

COMPUTER COVERS

Features heavy duty canvas with vinyl interior - waterproof

Reg. $15.95
$6.99

CMD 64	$6.95
VIC 20	$6.99
Disk Drive	$6.99
Espon MX 80	$7.99
Espon MX 80 FT	$7.99
Okidata 92	$7.99

Special Offer

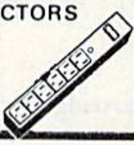
MW-350	$69
4K Buffer	$19

PRINTER INTERFACES

Datashare PPI	$41
Tymac Connection	$54
Cardco + G Wiz	$54
MW 302	$39
Grappler CD	$84

SURGE PROTECTORS

1 Outlet	$14
SPECIAL	
4 Outlet	$24
6 Outlet	$28



RIBBONS

Epson MX-80	$5
Epson M/Rx-100	$8
SG-10	$3
SG-15	$3

Ordering & Payment Policy

Prices reflect a cash discount. For Visa, and Mastercard add 3% Immediate delivery with certified check or wired funds. N.J. resident add 6%. Prices subject to change.

USA SHIPPING

For shipping and handling add 4% ($4 minimum) Larger shipments require additional charge. C.O.D. add $3.50

DISKS

Special of the Month
BULK SS/DD DISK

10	50	100
$9.99	$48	$90

Maxell SS/DD	$15.99
Disk Holder (50)	$11.95

Printer Specials

Doodle	$26
Print Shop	$29
Print Shop Graphics	$18.95
Paper 1000 sheets	$19.95
Paper 2500 sheets	$34.95

FOR INFORMATION CALL (609) 596-1944 MON.-FRI. 10-5

ORDER TOLL FREE (800) 992-3300

Mon., Thurs., Fri. 9-8
Tues., Wed. & Sat. 10-6

PC GALLERY

P.O. Box 3354
Cherry Hill, N.J. 08034

HARDWARE BUYER'S GUIDE

This is the second annual Hardware Buyer's Guide. The guide contains the peripherals and accessories released in 1985 that you can add to your Commodore computer. The information contained herein was taken from a questionnaire sent to manufacturers of Commodore products. The response to the questionnaire forms the basis of this guide. We are not responsible for any omissions or misinformation contained in this guide.

Find Out What's Available for Your Commodore

Analog-to-Digital Converters

ADL-6412 A/D Converter

A 16-input, 12-bit analog-to-digital converter that connects to the computer through the expansion port; software on tape and disk also available. $189

Technical Hardware, Inc.

Analog/Digital Converter

Allows eight channels of ten-bit resolution; includes software. $125

Micro R&D, Inc.

Universal Input/Output Board

Plugs into expansion port, allowing 16 analog channels and providing 16 high-current discrete outputs. $225

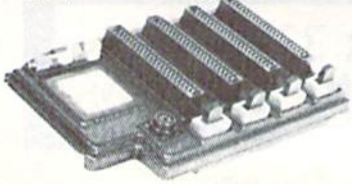
Micro R&D, Inc.

Applications Hardware

Aprospand-64 Expander

Four-slot expander features a system-reset button and fuse protection; each slot is independently switched. $34.95

Apropos Technology



Aproteck 1000 EPROM Programmer

An RS-232 connectable EPROM programmer; includes C-64 driver software. $265

Apropos Technology

APROTEK 1000
EPROM PROGRAMMER

Cartridge Expander

Allows you to plug in up to three modules to your computer at one time. $24.95

Navarone Industries, Inc.

COM Clock

Real-time clock/calendar with battery backup; includes autoboot feature. $69.95

Genesis Computer Corp.

Computereyes

This video acquisition system captures real-world images on your computer's high-resolution graphics display, which can then be reproduced on a printout. $129.95

Digital Vision, Inc.

80-Column Video Board

Transforms 40-column screen into 80-column display; eliminates snow, fuzziness, hashing and interference. $169.95

Batteries Included

Fastext Turbo-ROM

Enables the Smith-Corona Fastext-80 to emulate a Commodore 1525 printer when used with the Cardco G-Wiz. $19.95

Romco

Multitask 64

Plugs in up to three cartridges and hooks up to five computers, one printer and disk drive. $149.95

Handic Software

The Operating System

A cartridge-based customizing component that reconfigures the C-64's operating system to provide such features as escape keys, default to disk drive and improved video displays. $54.95

Hacker's Hardware

Ramdisk

Emulates most standard Commodore disk drive commands; software included. $325

Front Line Systems

The Serial Box

A 64K serial port print turbobuffer that lets you use your computer while your printer is printing. $49.95

R.J. Brachman Associates, Inc.

The Spartan

Apple II+ emulator allows the C-64 to run Apple II+ software. $599

Mimic Systems, Inc.

Stardos

This plug-in enhancement system increases your disk drive's speed and is compatible with your entire software library. $64.95

Starpoint Software

Turbo-ROM

An easily installed replacement for the standard ROM that comes with your Cardco +G. $19.95

Romco

ZOT

An EPROM programmer that lets you program all or part of an EPROM chip. $170 Canadian

Serendipity Ventures, Inc.

Cables

C-128/80
This five-foot video adapter cable enables the C-128 to output 80-column monochrome displays to any standard composite video monitor. $9.95
Cardco, Inc.

KN-128-1
This cable allows you to use any monitor with the C-128's 80-column mode. $14.95
Knight Software, Ltd.

Interex-5
This monitor cable replaces the five-pin connector with a four-pin RCA plug. $6.95
DSI

Interex monitor cables
RGB monitor cables connect your C-128 to monitors by Sakata, Amdek, Princeton, Zenith, NEC, Panasonic, Taxa and Sharp. $20.95–$35.95
DSI

Computers

Commodore 128 Personal Computer
Offers 128K RAM expandable to 512K; user-selectable 40- and 80-column full-color display; compatible with C-64 and CP/M software; 92-key keyboard, including numeric keypad; operates with optional mouse controller. $299
Commodore International, Ltd.

Disk Drives

BCD5-25 Disk Drive
Reads and writes programs faster and stays cooler than Commodore disk drives. $179
Blue Chip Electronics, Inc.

CS-1
Commodore 1541-compatible, with proprietary operating system, Q-DOS. $239.99
Peripheral Systems of America

NPH-501C
Formats a disk in 38 seconds; includes external power supply. $189
Video Logic Corp.

SFD-1001
Offers one-megabyte storage capacity on a double-sided, double-density format. $399.95
Progressive Peripherals and Software, Inc.

ST10C
This hard-disk drive system features unlimited directory space, 154 tracks, IEEE and serial interface. $1595
Computer Specialties, Inc.

Clone II
Copies, formats and verifies a disk in under two minutes; C-64-compatible; can daisy-chain up to four drives. $499
HBH Sales Company

Commodore 1571 Disk Drive
This double-sided, 5¼-inch floppy disk drive offers 360K–410K formatted storage capacity. Operates at 300 cps in C-64 mode; operates at 2000 cps in C-128 mode and can read most CP/M-formatted programs. $300
Commodore International, Ltd.

Commodore 1572 Dual Disk Drive
This disk drive offers a transfer rate of up to 5200 cps and up to 820K of data storage. It features two 5¼-inch disk drives that can select the C-64, C-128 and CP/M formats; compatible with other computers using 5¼-inch CP/M formats. Price N/A
Commodore International, Ltd.

Enhancer 2000
Commodore-compatible 5¼-inch drive with direct-drive motor and an average mtbf rate of 10,000 hours. $199.95
The Comtel Group

Lt. Kernal
Supports storage capacities from five to 144 megabytes and implements all 1541 DOS functions; package includes cartridge-port interface, disk/controller subsystem and software. $1595
Fiscal Information, Inc.

Mirage Disk Drive
Features built-in parallel printer interface and word processing, file management and Mirage Utility Disk programs. $249.95
World Disk Drive

Quick Data Drive
This disk drive uses microwafers instead of disks and loads a 24K program in 20 seconds. $84.95
Entrepo, Inc.

Disk Drive Coolers

Cool Stack
This disk-drive cooling unit allows two 1541s to be stacked one on top of the other. $64
Carbo Tech, Inc.

Single-drive Cooling Unit
Cooler for your 1541 disk drive comes with filters. $34
Carbo Tech, Inc.

commodore
1541

UniKool C-100 Disk Drive Fan
Fan moves filtered air through disk drive to reduce drive misalignment problems caused by heat build-up. $39.95
UniKool

Expansion Boards

XL 80
An 80-column video board with Basic enhancements, word processor, spreadsheet with graphing option, smart terminal for telecommunications and disk-copy utility. $99
Data 20 Corp.

Analog Interface Board
This board provides eight channels analog to digital and eight channels digital to analog. $195
Computer Continuum

DOS Board
The board allows you to simplify complex disk operating statements and increase the data transfer speed of your 1541 disk drive system. $99.95
Search Consultants International

Single-slot Expansion Board
Fully switched, including game, enable and power switches, and reset button. $24.95
CSM Software, Inc.

General Interfaces

1541 Flash!
Connects between your computer and the 1541 disk drive to enable faster loads and saves of programs and data; wedge included. $90
Skyles Electric Works

E-Link
A serial-to-IEEE interface connects IEEE disk drives and printers to your computer. $99.95
Progressive Peripherals & Software, Inc.

JE232CM
This adapter allows you to connect standard serial RS-232 printers and modems to your Commodore computer. $39.95
Jameco Electronics

Handic V24 RS-232 Interface
This interface lets your computer communicate with printers and modems. $64.95
Handic Software

MicolMon
A machine-language monitor and user-to-computer interface designed to help you debug your programs. $24.95
Micol Systems

E-LINK
PROGRESSIVE PERIPHERALS & SOFTWARE
SERIAL TO IEEE INTERFACE

MIDI Interface

Connects MIDI instruments to your computer; syncs to and from MIDI, tape and drum machines. $149.95 (includes drum sync); $199.95 (includes tape and drum sync)

Passport Designs, Inc.

MIDI Magic

A musical instrument digital interface that allows you to connect your computer to many electronic musical instruments. $49.95

Q-R-S Music Rolls, Inc.

Network

A multi-user system that can connect up to eight computers to one printer and a single disk drive. $149.95

Handic Software

Projector Control PC/I

This Carousel slide projector interface connects to your C-64 to provide random-access slide searches and includes the Slide-Finder cataloging and retrieval software. $697

Interactive Technology, Inc.

Ham Radio Interfaces

RF Receiver Interface

Receives RF signals from remote RF transmitters. $149.95

Genesis Computer Corp.

RTTY Computer Interface

Lets you send and receive computerized RTTY/ASCII/AMTOR/CW and copies on both mark and space tones. $99.95

MFJ Enterprises, Inc.

Deluxe RTTY Computer Interface

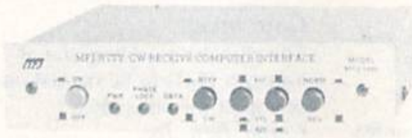
Interfaces your computer to a ham radio transceiver or receiver for Morse code, RTTY and ASCII; includes software on tape. $179.95

MFJ Enterprises, Inc.

Short Wave Listener

For reception of Morse code and radio teletype signals between your computer and short wave radio. $64

Microlog Corp.



Universal Receiver Computer Interface

Use your computer to receive commercial, military and amateur traffic. $69.95

MFJ Enterprises, Inc.

Joysticks, Trackballs & Game Paddles

CSP

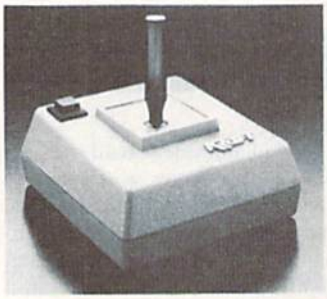
Commodore-compatible game paddles. $4.95

Jameco Electronics

Commodore Joystick

Includes MazeMaster feature for four- or eight-direction operation, and an eight-foot cord. $12.95

Kraft Systems



Competition Pro 200X

This joystick features a five-foot cord and a fire-button that is molded into the joystick case. $8.95

Coin Controls, Inc.

Switch Hitter

This joystick provides two fire-buttons for left- and right-handed play. $14.95

Kraft Systems

Trackball

Duplicates play-action of arcade machines and features 360° movement. $49.95

Wico Corp.

Keyboards & Input Pads

Add-On Numeric Keypad

Besides the 0–9 keys, the keypad includes +, –, / and *, two cursor keys and enter keys. $69.95

Quality Computer

Cardkey-1

This numeric keypad is configured in the standard calculator-keyboard layout; software included. $49.95

Cardco, Inc.

Nimble Numbers
BVI

Nimble Numbers Keypad

Keypad includes cursor keys, return, shift, clear/home, insert/delete and selectable period and comma keys. $65 Canadian

Serendipity Software, Inc.

Numeric Keypad

Compatible with all software and with extra functions. $64.95

CSM Software, Inc.

Input Devices

Animation Station

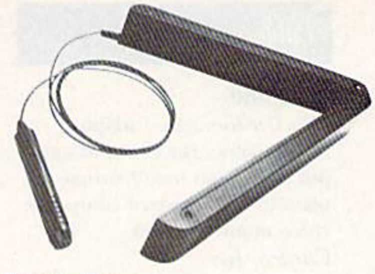
This is a touch-sensitive graphics tablet that serves as a graphics and text processor. $79.95

Suncom

Commodore Mouse

The mouse simplifies data input and manipulation on the C-128 by allowing you to paint pictures on the screen and to select menu options without typing in commands. $49.95

Commodore International, Ltd.



Space Pen

Utilizes ultrasonic technology to take the place of light pens, mice, joysticks, paddles, touch screens and touch tablets. $150

Soniture, Inc.

The Space Tablet

This input device allows you to send three-dimensional ultrasonic signals to your computer from as far away as six feet, and it can be used with existing graphics packages. $150

Soniture, Inc.

Sure Light Pen

Features include one-pixel accuracy, high resolution and Color Easy, to use with a free-drawing program. $22.95

Creative Enterprises

Tech Sketch

Light pen; includes software. $49.95

Tech Sketch, Inc.

Memory Expansion Devices

Access-M

A memory expansion board that plugs into the ROM expansion port of your computer; includes software and allows memory expansion of up to one megabyte. $199.95

Mosaic Electronics, Inc.

RAMdisk-64

64K memory-expansion cartridge includes RAMdisk software. $129.95

P Technologies

Miscellaneous

CPS-10

This power supply has two 100-watt outlets, surge and spike protection, RFI and EMI protection. $59.95

HBH Sales Company

Classic Laid Stationery
Continuous clean-edge perf stationery has a detached size of 7¼ × 11 inches and matching continuous envelopes. Package of 100 sheets of stationery is $4.50; package of 50 continuous envelopes is $9
CompuGreet

Commodore 1902 RGBI Composite Monitor
This monitor supports 40- and 80-column color display; compatible with videocassette recorders and all computers using RGBI or composite output, including the C-128. $300
Commodore International, Ltd.

Copy Holder
Fully adjustable magazine holder clamps onto desk to free your hands for typing in program listings. $32
Carbo Tech, Inc.

Custom-made Dust Covers
Custom-made, matching vinyl dust covers come in light tan or brown, for all Commodore computers, monitors, disk drives and printers. $5–$23
Crown Custom Covers

Digi-Cam
Produces a 320- × 200-dot black-and-white screen image and includes digitizer, software, cables and monochrome camera with 12mm lens. $250
Cardco, Inc.

Hi-Rise Computer/ Printer Stand
This stand is constructed of solid oak and uses less than two square feet to contain your monitor, disk drive and printer. $39.95
Unique Wood Products

How to Operate the Commodore 64
Takes the beginner from unpacking the computer through basic operations and keyboard functions; comes with two audio tapes, several programs on cassette and a reference guide. $25
FlipTrack Learning Systems

Media Mate 5 Plus
A lockable filing and storage system that holds up to 50 5¼-inch disks and can be stacked for storage and transported without scattering disks. $20.95
Amaray International Corp.

Nibble Notch I Disk Tool
Accurately cuts a square write notch in your 5¼-inch disks to allow you to use the back side of the disk. $14.95
Nibble Notch Computer Products

Read/Write Microcomputer Cleaning Kit
Includes a floppy disk head cleaner and metered spray, Static Stopper, Static Stopper cloth, 30 Datawipes, 24 CRT terminal cleaning pads and ten office equipment cleaning pads. $34.95
The Texwipe Co.

Reset Master
A reset switch that resets your computer, restores control in case of a lockup and operates two printers concurrently. $24.95
Master Software

ROM Descender Chip
Works with Commodore 801 and 1525 printers. $29.95
Wilanta Arts

Smart Strip
The Smart Strip automatically turns periphrals on and off and provides surge protection. $54.95
RSR Manufacturing

Static Buster
This static control device consists of two foampads that connect to the CRT face and the keyboard. $49.95
Lamb's Information Systems, Inc.

Thermocouple Amplifier
Takes up to 16 low-voltage inputs and produces a corresponding voltage output in the range of 0–4 volts dc. $105 for first channel; $85 per additional channel.
Micro R&D, Inc.

Modems

C-64 Modem
Use this 300-baud modem with single- or multi-line phones. $49.95
MFJ Enterprises, Inc.

GE 3-8200 Modem
Offers a 300-baud signal rate and a choice of both direct and acoustic connection. $119.95
General Electric Co.

Commodore 1660 Modem/300
This direct-connect modem operates at 300 baud and features auto-answer, auto-dial and a built-in speaker. $129.95
Commodore International, Ltd.

Commodore 1670 Modem/1200
This 1200-baud direct-connect telephone interface features auto-answer/auto-dial, auto-baud and parity, and is compatible with Commodore's 300-baud modems. $199.95
Commodore International, Ltd.

Lightning 24
This 300/1200/2400 bps modem offers auto-dial/auto-answer capabilities, low power consumption and three-speed operation. $599
Anchor Automation, Inc.

Mitey Mo
Auto-answer, auto-dial modem includes Smart 64 software and free CompuServe and PlayNet access time. $119
Computer Devices International

Mercury
A 300/1200-baud modem that supports all popular communications software packages and features front-panel display lights. $265
Computer Friends

Total Telecommunications
A modem and intelligent modem software gives you access to over 50 databases. $124.95
TeleLearning Systems, Inc.

Music Keyboards & Sound Devices

Concertmaster
A 40-note unit with detachable cover that doubles as a music holder; includes software Price N/A.
Melodian, Inc.

Incredible Musical Keyboard
Fits on top of C-64 keyboard, no external cable connections required; 24 piano-style keys. $29.95
Sight & Sound Music Software, Inc.

MusicMate
Fully-functional keyboard, with full-size keys; fully polyphonic; includes software. $99
Sequential, Inc.

Music Port
A musical keyboard and software system that features a 37-key electronic keyboard with digital synthesizer capability and allows you to create your own accompaniment. $149
Tech Sketch, Inc.

RoomMate
This stereo-speaker set is compact and lightweight and, with an RCA-plug adapter, works with any sound source that has a headphone or phono jack. $229
Bose Corp.

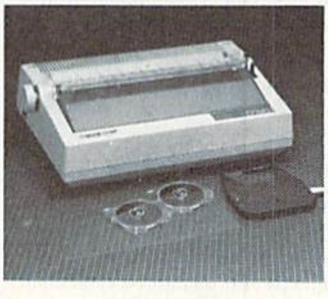
Soundchaser 64 Keyboard
Four octaves; includes composing and synthesizer software. $199
Passport Designs, Inc.

Video RoomMate
Stereo-speaker set offers volume control and shielded drivers to prevent television interference. $229
Bose Corp.

Printers

1101
Uses standard IBM Selectric-type ribbon cartridges; 13-inch platen; uses serial cable in place of interface. $349.95
Commodore International, Ltd.

D12/10
A 12-cps daisywheel printer; includes Commodore interface and software. $249
Blue Chip Electronics, Inc.



D20/10
20-cps daisywheel printer with C-64 Centronics I/O built in. $279
Blue Chip Electronics, Inc.

M120/NLQ
Dot-matrix printer with Near Letter Quality mode, 120 cps; includes C-64 I/O and word processor. $249
Blue Chip Electronics, Inc.

MPS 803

This 6 × 7 dot-matrix printer is bi-directional and features all alphabetic, numeric and PET graphics characters, 60 cps and 80-column width. $199.95
Commodore International, Inc.

SG-10C

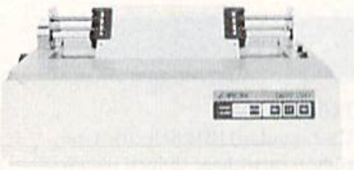
A dot-matrix printer with near letter-quality print option and print speeds of 30 and 120 cps. $299
Star Micronics

SG-15 Printer

This is a 15-inch, dual-mode printer capable of both draft (at 120 cps) and near letter-quality (at 30 cps) printing. $499
Star Micronics

Aprotek Daisy 1120 Printer

Features include four front-panel pitch selections, automatic paper load and switch-selectable page length. $353
Apropos Technology



Cardprinter LQ/2

This printer prints at 12 cps, 12 cpi bi-directionally with logic seeking. $350
Cardco, Inc.

Commodore MPS-1000 Printer

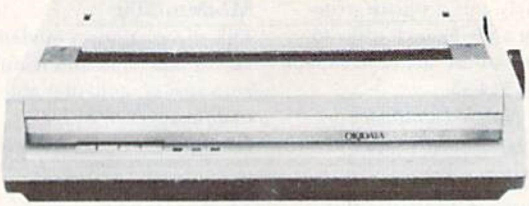
This printer features three operating modes: a high-speed draft that prints documents at 100 cps, a near-letter-quality mode at 16 cps and a graphics mode with a print density of 50–240 dots per inch. $299.95
Commodore International, Ltd.

HomeWriter 10

This dot-matrix printer can produce many popular typestyles at 100 cps and includes a C-64 compatible cartridge. $320
Epson America, Inc.

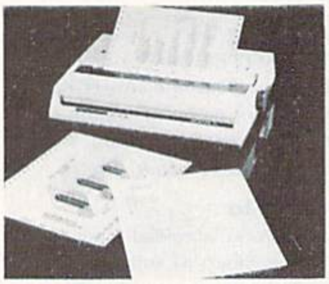
Microline 182

A printer for heavy business and home use that can be used to print graphics and charts. $299
Okidata



Microline 192

High-resolution, correspondence-quality bi-directional printer with snap-in cartridge ribbon. $499
Okidata

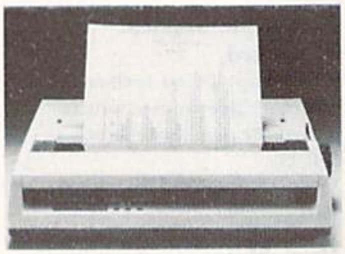


Model 3-8100 Dot-matrix Printer

Features include automatic line-feed, full graphics capacity and a choice of either 25 or 50 cps print speed. About $390
General Electric Co.

Okimate 10

A dot-matrix ribbon transfer printer with full graphics capabilities; prints over 40 color shades. $149
Okidata



Okimate 120

Seven print modes for bidirectional dot-matrix printer, comes with computer paper. $269
Okidata

Seikosha SP-100 VC Printer

A high-resolution dot-matrix printer with Commodore direct-connect; 100 cps, multiple fonts, tractor and friction feed, plus correspondence quality. $279.95
Apropos Technology

Printer Interfaces

ApriCord CD

This printer interface allows parallel graphics printers to emulate Commodore printers. $69.95
Apricorn

Card/?PS

A universal parallel/serial printer interface uses standard Commodore printer format; driver programs not required. $79.95
Cardco, Inc.

Centronics Interface

Designed to allow Commodore computers to output to parallel interface printers; supports seven or eight bits. $89.95
Computer Specialties, Inc.

The Connection

The Connection

A parallel printer interface that supports all standard printer commands, features a 2K buffer and is compatible with any parallel printer equipped with a Centronics interface. $69.95 (non-Epson); $73.95 (Epson)
Tymac Controls Corp.

G-Wiz

An interface to connect your computer to any Centronics printer and features increased print speed on many dot-matrix printers, open access to DIP switches and a choice of two character sets. $66.95
Cardco, Inc.

Grappler CD

A parallel interface with four modes includes screen dumps and supports most printers via a DIP switch. $119
Orange Micro, Inc.

Parallel Printer Interface

This interface includes a graphics buffer. $49.95
DSI

Printer Interface

Complete graphics emulation of Commodore printers, with switch settings for all standard parallel printers. $129
Micro R&D, Inc.

Printmaster/ + G

This parallel printer interface emulates Commodore printers and supports full graphics and graphics characters. $119.95
Omnitronix, Inc.

Printmaster/S

This is an RS-232 printer interface that hooks up to the Commodore serial bus and is switch selectable for 300, 600, 1200 and 2400 baud. $119.95
Omnitronix, Inc.

Serial and Graphics Printer Interfaces

The SPI, SPI/B and GPI interface Centronics parallel compatible printers. $59.95 (SPI); $69.95 (SPI/B); $79.95 (GPI)
Xetec, Inc.

Robotics

Micro-Kitten

This mobile robot kit has a range of uses, including automation modeling, transporting, drawing and gaming; expansions include sensing devices, radio control and on-board intelligence. $330 (assembled); unassembled kits available.
Spectron Instrument

Robotic Programming Kit

A robotics construction kit with robot-control language includes projects suitable for beginner and engineer. $199
Parsec Research

The Valiant Turtle
A remote-controlled programmable robot to make programming concepts accessible to children as young as pre-school age. $399.95
Harvard Associates

Sensors & Control Devices

1020 Control Interface
Provides 32 digital inputs and outputs for measurement and control applications. $159
Innovative Technology

ADC-1
This is a measurement, monitoring and control system that allows you to aquire data and control external devices. $395
Remote Measurement Systems

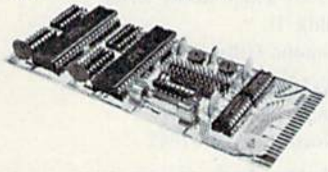
REL 64 Relay Cartridge
Plugs into user port and controls lights, alarms, phones and garage doors. $39.95
Handic Software

X-10 Powerhouse
This interface system controls lights and appliances; includes software and cable. $150.00
X-10 (USA), Inc.

Comp-U-Temp, Version 1.0
Eight-channel temperature monitor records temperatures as low as −15°F. $89.95
Applied Technologies, Inc.

Comp-U-Temp, Version 2.0
Eight-channel temperature monitor stores data to, and reads from, disk. $109.95
Applied Technologies, Inc.

Comp-U-Temp Version 3.0
16-channel temperature monitor includes four sensors and software. $179.95
Applied Technologies, Inc.



Dual 6522 VIA Board
Among other uses, this versatile interface adapter controls and monitors the lights, temperature and security system in your home. $169
Schnedler Systems

Home Control System
This control system includes BSR X-10 control, real-time clock/calendar and six-port input device. $199.95
Genesis Computer Corp.

Powerport
This energy control device, for home and business use, regulates your heating, lighting and cooling systems. Under $100
Savergy, Inc.

Sensatrol
This sensor/controller interface allows you to measure weather conditions, control thermostats and monitor environmental conditions. $385
Data World Products

Sensors for Comp-U-Temp
Weather-protected encapsulated thermistors. $5.75 each
Applied Technologies, Inc.

COMP-U-TEMP
COMP -U- TEMP

Simple IF Data Acquisition System
Allows you to control temperature, monitor the weather, measure voltage and use in robotics. Under $100
Proteus Electronics, Inc.

Temperature Sensor
Temperature readings from −55°C to 150°C. $25
Micro R&D, Inc.

Synthesizers

64-Talker
Self-contained speech synthesizer features text-to-speech and multiple voices. $89
Talktronics, Inc.

JE520CM
A voice synthesizer with more than 250 basic words; prefixes and suffixes allow you to form over 500 words. $99.95
Jameco Electronics

Personal Speech System
Converts computer data into spoken English. $395
Votrax, Inc.

Pro-Voice
A speech synthesizer, including ROM-based text-to-speech translation and 13 new Basic commands. $99.95
Genesis Computer Corp.

Type-'N-Talk
Converts computer data into spoken English and operates from a CMOS synthesis chip and general microprocessor. $249
Votrax, Inc.

Voice Master
A speech synthesizer that makes your computer speak to you in your own voice, respond to your spoken commands and play back songs that you hum or whistle. $89.95
Indus-Tool

Voice Master Speech System
A digital speech recording/playback system with voice recognition and musical capabilities; includes the Voice Master module, microphone, earphone headset, software and user's manual. $89.95
Covox, Inc.

Voice Messenger
A speech synthesizer with unlimited vocabulary and direct text-to-speech capability. $59.95
Research in Speech Technology, Inc.

Hardware Manufacturers Address List

Amaray International Corp.
14935 N.E. 95th St.
Redmond, WA 98052

Anchor Automation, Inc.
6913 Valjean Ave.
Van Nuys, CA 91406

Applied Technologies, Inc.
Lyndon Way
Kittery, ME 03904

Apricorn
7050 Convoy Court
San Diego, CA 92111

Apropos Technology
1071-A Avenida Acaso
Camarillo, CA 93010

Batteries Included
17875 Sky Park North, Suite P
Irvine, CA 92714

Blue Chip Electronics, Inc.
2 W. Alameda
Tempe, AZ 85282

Bose Corp.
The Mountain
Framingham, MA 01701

R.J. Brachman Associates, Inc.
PO Box 1077
Havertown, PA 19083

CSM Software, Inc.
PO Box 563
Crown Point, IN 46307

Carbo Tech, Inc.
PO Box 652
Snellville, GA 30278

Cardco, Inc.
300 S. Topeka
Wichita, KS 67202

The Comtel Group
1651 East Edinger, Suite 209
Santa Ana, CA 92705

Coin Controls, Inc.
2609 Greenleaf Ave.
Elk Grove, IL 60007

Commodore International, Ltd.
1200 Wilson Drive
West Chester, PA 19380

CompuGreet
PO Box 3357
Reston, VA 22090

Computer Continuum
75 Southgate Ave., Suite 6
Daly City, CA 94015

Computer Devices International
1345-A2 Doolittle Drive
San Leandro, CA 94563

Computer Friends
6415 S.W. Canyon Court,
Suite 10
Portland, OR 97221

Computer Specialties, Inc.
PO Box 1718
Melbourne, FL 32902

Covox, Inc.
675-D Conger St.
Eugene, OR 97402

Creative Enterprises
PO Box 2477
Big Bear City, CA 92314

Crown Custom Covers
9606 Shellyfield Road
Downey, CA 90240

DSI
717 S. Emporia
Wichita, KS 67211

Data 20 Corp.
23011 Moulton Parkway,
Suite B10
Laguna Hills, CA 92653

Data World Products
PO Box 33
Francestown, NH 03043

Digital Vision, Inc.
14 Oak St., Suite 2
Needham, MA 02192

Entrepo, Inc.
1294 Lawrence Station Road
Sunnyvale, CA 94089

Epson America, Inc.
2780 Lomita Blvd.
Torrance, CA 90505

Fiscal Information, Inc.
PO Box 10270
Daytona Beach, FL 32020

FlipTrack Learning Systems
999 Main St., Suite 200
Glen Ellyn, IL 60137

Front Line Systems
38 Broadway St.
Westford, MA 01886

General Electric Co.
Electronics Park
Syracuse, NY 13221

Genesis Computer Corp.
Ben Franklin Tech Center
Lehigh University
Bethlehem, PA 18015

HBH Sales Company
225 West Main
Collinsville, IL 62234

Hacker's Hardware
PO Box 7933
San Diego, CA 92107

Handic Software
400 Paterson Plank Road
Carlstadt, NJ 07072

Harvard Associates
260 Beacon St.
Somerville, MA 02143

Indust-Tool
730 West Lake St.
Chicago, IL 60606

Innovative Technology
510 Oxford Park
Garland, TX 75043

Interactive Technology, Inc.
PO Box 948
Springdale, AR 72765

Jameco Electronics
1355 Shoreway Road
Belmont, CA 94002

Knight Software, Ltd.
Box 975-G6
Plainfield, CT 06374

Kraft Systems
450 West California Ave.
Vista, CA 92083

Lamb's Information Systems, Inc.
301 N. Main St.
Pueblo, CO 81003

MFJ Enterprises, Inc.
921 Louisville Road
Starkville, MS 39759

Master Software
6 Hillery Court
Randallstown, MD 21133

Melodian, Inc.
115 Broadway, Suite 1202
New York, NY 10006

Micol Systems
100 Graydon Hall Drive, Suite 2301
Don Mills, Ontario, Canada
M3A 3A9

Microlog Corp.
18713 Mooney Drive
Gaithersburg, MD 20879

Micro R&D, Inc.
3333 S. Wadsworth Blvd., A-104
Lakewood, CO 80227

Mimic Systems, Inc.
1112 Fort St., 6th Floor
Victoria, B.C., Canada V8V 4V2

Mosaic Electronics, Inc.
PO Box 708
Oregon City, OR 97045

Navarone Industries, Inc.
19968 El Ray Lane
Sonora, CA 95370

Nibble Notch Computer Products
4211 N.W. 75th Terrace
Fort Lauderdale, FL 33319

Okidata
532 Fellowship Road
Mt. Laurel, NJ 08054

Omnitronix, Inc.
PO Box 43
Mercer Island, WA 98040

Orange Micro, Inc.
1400 N. Lakeview Ave.
Anaheim, CA 92807

P Technologies
6905 Speckle Way
Sacramento, CA 95842

Parsec Research
41805 Albrae St.
Fremont, CA 94538

Passport Designs, Inc.
625 Miramontes St.
Half Moon Bay, CA 94019

Peripheral Systems of America
2526 Manana Road, Suite 209
Dallas, TX 75220

Progressive Peripherals Software, Inc.
2186 South Holly
Denver, CO 80222

Proteus Electronics, Inc.
RD #2, Spayde Road
Bellville, OH 44813

Romco
PO Box 18359
Wichita, KS 67218

Q-R-S Music Rolls, Inc.
1026 Niagara St.
Buffalo, NY 14213

Quality Computer
801 S. Victoria Ave., Suite 104
Ventura, CA 93003

RSR Manufacturing
6337 S. Highland Drive, Suite 1054
Salt Lake City, UT 84121

Remote Measurement Systems
PO Box 15544
Seattle, WA 98115

Research in Speech Technology, Inc.
104 W. Fourth St.
Royal Oak, MI 48067

Savergy, Inc.
1404 Webster Ave.
Fort Collins, CO 80524

Schnedler Systems
1501 N. Ivanhoe St.
Arlington, VA 22205

Search Consultants International
PO Box 401
Haslett, MI 48840

Sequential, Inc.
3051 North First St.
San Jose, CA 95134

Serendipity Venture, Inc.
PO Box 1944
Saskatoon, Saskatchewan,
Canada S7K 3S5

Sight & Sound Music Software, Inc.
3200 South 166th St.
New Berlin, WI 53151

Skyles Electric Works
231-E South Whisman Road
Mountain View, CA 94041

Soniture, Inc.
480 Vandell Way
Campbell, CA 95008

Spectron Instrument
Robot Division, MS 36
1342 W. Cedar Ave.
Denver, CO 80223

Star Micronics
200 Park Ave.
New York, NY 10166

Starpoint Software
Star Route
Gazelle, CA 96034

Suncom
260 Holbrook Drive
Wheeling, IL 60090

Talktronics, Inc.
27341 Eastridge Drive
El Toro, CA 92630

Technical Hardware, Inc.
PO Box 3609
Fullerton, CA 92634

Tech Sketch, Inc.
26 Just Road
Fairfield, NJ 07006

TeleLearning Systems, Inc.
505 Beach St.
San Francisco, CA 94133

The Texwipe Co.
PO Box 575
Upper Saddle River, NJ 07458

Tymac Controls Corp.
127 Main St.
Franklin, NJ 07416

Ultrabyte
PO Box 789
La Canada, CA 91011

UniKool
909 Williamson Loop Road
Grants Pass, OR 97526

Unique Wood Products
PO Box 52
Mankato, MN 56001

Video Logic Corp.
597 N. Mathilda Ave.
Sunnyvale, CA 94086

Votrax, Inc.
1394 Rankin Road
Troy, MI 48083

Waveform Corp.
1912 Bonita Way
Berkeley, CA 94704

Wico Corp.
6400 W. Gross Point Road
Niles, IL 60648

Wilanta Arts
6943 Barrisdale Drive
Mississuaga, Ontario, Canada
L5N 2H5

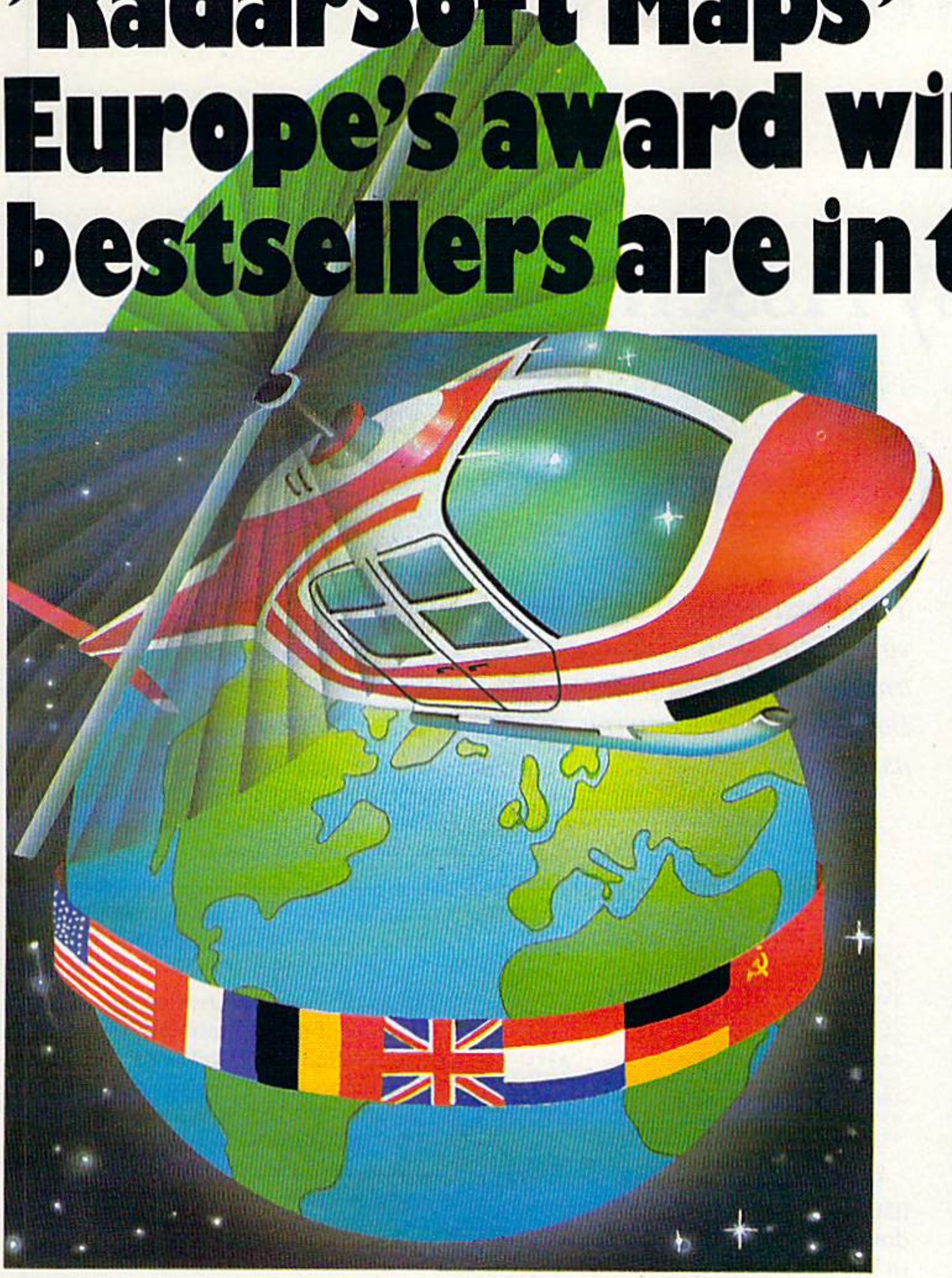
World Disk Drives
23501 Ridge Route Drive
Bldg. D
Laguna Hills, CA 92653

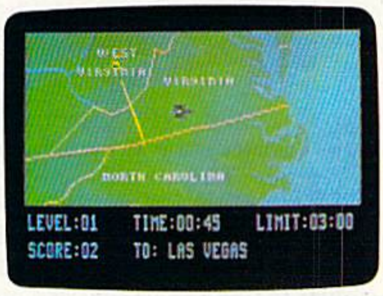
X-10 (USA), Inc.
185A LeGrand Ave.
Northvale, NJ 07647

Xetec, Inc.
3010 Arnold
Salina, KS 67401

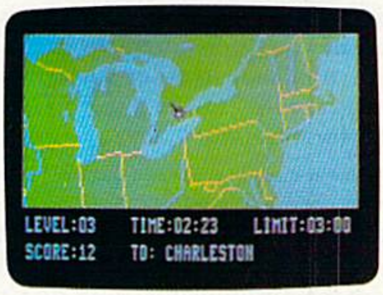
Circle 17 on Reader Service card.

'RadarSoft Maps' Europe's award winning bestsellers are in the USA.

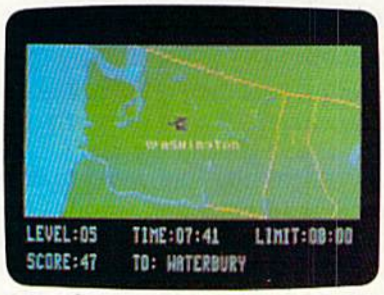




```
LEVEL:01    TIME:00:45    LIMIT:03:00
SCORE:02    TO: LAS VEGAS
```



```
LEVEL:03    TIME:02:23    LIMIT:03:00
SCORE:12    TO: CHARLESTON
```



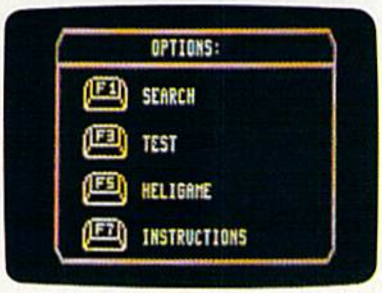
```
LEVEL:05    TIME:07:41    LIMIT:08:00
SCORE:47    TO: WATERBURY
```

Beat the computer in a race to find the cities, rivers and mountains of the States, all in smooth scrolling colorgraphics on your Commodore 64 or 128.

Fly your helicopter across
- the States with MAPS USA
- the World with MAPS WORLD
- Europe with MAPS EUROPE

Three separate map games, each game with lots of variation to let you change the rules, change the pace and increase the fun.

If you're feeling cramped for space with the CBM 64, take a look at RADARBASIC 50K; the way smart programmers get 50K of application code out of there 64.



RADARSOFT is tops in Europe! RADARSOFT is selling to-day in the USA and there are lots more smash hits to come from Europe's winner!

TRY A MAPS!... but beware, once a RADARSOFT addict ...always a RADARSOFT addict.

Go ask the first dealers who couldn't resist!

- MICROSPHERE, South Bend, Indiana
- MEGASOFT, Battleground, Washington
- TUSSY COMPUTER PRODUCTS, State College, Pennsylvania
- TRIED COMPUTER, Winston Salim, North Carolina
- TIMEWORKS, Deerfield, Illinois
- AA COMPUTER EXCHANGE, Jacksonville, Florida

... or phone ACK Inc., San Francisco, California. 4152395357, the people who deliver products.

RADARSOFT ©

Easy Assembly VI

By WILLIAM B. SANDERS

Up to this point, we've been using a single register—the accumulator, or A, register. This month's installment introduces the X and Y registers along with new addressing modes. We'll start with the instructions that are similar to those using the accumulator; then we'll examine how to use these new registers interactively with the accumulator in new modes. First, let's review the instructions you have so far for the accumulator:

LDA Absolute and Immediate modes
STA Absolute and Immediate modes

You know that LDA refers to LoaD the Accumulator and STA means STore the Accumulator. What do you think the following mean?

LDX LDY STX STY

If you guessed they refer to loading and storing the X and Y register contents, you're absolutely right. They work exactly like the A register instructions in both the Absolute and Immediate modes. To illustrate the use of these registers, we'll use the screen and color addresses to place values. Screen addresses begin at $400 (1024) and color addresses begin at $D800 (55296). They are sequentially arranged in 25 rows of 40 columns, beginning in the upper left-hand corner of your screen.

Let's write a quick program to show what happens when you use these registers to store values in the color and screen locations:

```
LN LABEL OPCODE OPERAND COMMENT

--------------------------------
1          JSR    $E544   CLR/HOME
2          LDA    #1      WHITE
3          STA    $D800   COLOR
4          LDX    #1      'A'
5          STX    $400    SCRN MEM
6          STA    $D801   NEXT COL
7          LDY    #2      'B'
8          STY    $401    NEXT SCR
9          RTS
```

This installment introduces you to the X and Y registers and tells you how to print out the source code using your assembler.

```
ADRS          OPCODE        OPERAND
49152         JSR           $E544
49155         LDA#            1
49157         STA           $D800
49160         LDX#            1
49162         STX           $400
49165         STA           $D801
49168         LDY#            2
49170         STY           $401
49173         RTS
```

So far, these registers work just like the accumulator. In fact, there doesn't seem to be any reason at all to use them, since you haven't seen anything they can do that cannot be done with the accumulator alone. Well, if you think that, then take a careful look at the program.

Notice that in line 2, you load the accumulator with the value 1. Then you store that 1 in $D800, the color address for the character in the upper left-hand corner of your screen. Then, in line 6, you store the same value in $D801, the next screen color address.

The significance of that little move is that by using the X and Y registers, you were able to keep a constant value in the A register. Conversely, you could have stored that value in either the X or Y register. Granted, you only saved a single step, since, without the other registers, you would have had to reload only the accumulator. However, you'll find more and more steps to be saved, making your programming task simpler as you use the different registers and instruction modes.

Register Transfer

In some applications, it will be necessary to transfer the contents of one register to another. To do that, you have four instructions:

TAX	Transfer Accumulator to X register
TAY	Transfer Accumulator to Y register
TXA	Transfer X register to Accumulator
TYA	Transfer Y register to Accumulator

Those of you who are sharper than the author of this column may be wondering, "What about transferring the X register to the Y register and vice versa?" To do that, it is necessary to first go through the accumulator. For example, if you wanted to transfer the X register contents to the Y register, you would have to execute the following sequence:

TXA	X contents go to Accumulator
TAY	A contents go to Y register

See if you can figure out how to transfer the Y to the X register.

These instructions are in the Implied mode and use up only a single byte. However, before using them in a program, there are some other X and Y instructions we should learn. These instructions increment (add) or decrement (subtract) 1 from the X or Y registers. They look like this:

INX	Increment the X register
INY	Increment the Y register
DEX	Decrement the X register
DEY	Decrement the Y register

They, too, are in the Implied

HOW TO GET OVER $2000 WORTH OF NEW CAPABILITIES FOR YOUR COMMODORE 64™

SPARTAN
commodore

FOR $599*

The Spartan™ is the Apple™ II+ emulator for your Commodore 64™ that will open up a whole new world of hardware and software for you! Imagine adding these features to your Commodore 64™ for the Spartan™ price of $599: ☐ Apple™ II+ hardware and software capabilities ☐ 64K RAM expansion ☐ four software selectable Commodore 64™ cartridge slots ☐ non-dedicated 8-bit parallel port ☐ standard audio cassette deck capabilities for your C-64™. The suggested retail value of comparable products offering only these capabilities is over $2200.00* — but the Spartan™ gives you much, much more! By building on your investment in your Commodore 64™— an excellent introductory computer — you create a whole new system with both C-64™ and Apple™ II+ capabilities. There is a whole other world out there! The huge selection of Apple™ II+ hardware and software is now yours to explore! Call toll free for the Spartan™ dealer nearest you.

*All prices quoted are in U.S. funds, freight and taxes not included. Value of components equivalent to the Spartan™ system are quoted from Apple™ II+ CPU and Apple™ II+ single disk drive 1983 list prices, and from current suggested list prices and component specifications of other peripheral manufacturers. Commodore 64™ and Commodore logo are trademarks of Commodore Electronics Ltd. and/or Commodore Business Machines, Inc. Apple™ II+ is a trademark of Apple Computer Inc. Spartan™ is a trademark of Mimic Systems Inc. and has no association with Commodore Electronics or Apple Computer Inc. The Spartan™ is manufactured by Mimic Systems Inc. under license granted by ATG Electronics Inc. of Victoria, B.C. Canada.

MIMIC

FOR INFORMATION WRITE:
MIMIC SYSTEMS INC.
1112 FORT ST., FL. 6A
VICTORIA, B.C.
CANADA V8V 4V2

TO ORDER CALL:
1-800-MODULAR
(663-8527)

Circle 43 on Reader Service card.

mode. Let's look at an example. If the X register has the value 55 in it and the INX instruction is given, then the X register is incremented by 1, making the value 56. A DEX instruction would subtract 1 from the X register, making it 54.

There is no increment/decrement instruction for the accumulator; so when "counting" is used in a program, often the X or Y register will do the count, with the TXA or TYA instructions transferring the results to the accumulator. Let's see how this works in a program:

```
LN LABEL OPCODE OPERAND COMMENT

--------------------------------
 1         JSR    $E544   CLR/HOME
 2         LDX    #65     ASCII 'A'
 3         TXA            X TO A
 4         JSR    $E716   TO SCREEN
 5         INX            X = X + 1
 6         TXA
 7         JSR    $E716
 8         INX
 9         TXA
10         JSR    $E716
11         RTS
```

```
ADRS          OPCODE         OPERAND
49152         JSR            $E544
49155         LDX#            65
49157         TXA
49158         JSR            $E716
49161         INX
49162         TXA
49163         JSR            $E716
49166         INX
49167         TXA
49168         JSR            $E716
49171         RTS
```

Now that you can do your ABC's in assembly language using TXA and INX, see if you can count from 9 to 0 using TYA and DEY. (Hint: ASCII 9 = 57.)

Indexed Addressing

This next mode of addressing, called Indexed Addressing, uses either the X or Y register (or both) and the accumulator. Basically, the X or Y register value is added to the current address to access the next address.

For example, let's say you want to use the screen addresses beginning at $400 (1024) and the color addresses beginning at $D800 (55296) and store characters in sequential locations. Using the X register as an index, you increment it to get the next screen and color address. To start, you load the X register with 0 (0 + address = first address). Then, STA is used in the Indexed mode to access $400 and $D800. The X register is incremented to 1 (1 + address = second address). In this case, it would be $401 and $D801.

Let's see how this looks and works in a program. We'll write ABC again, but this time we'll use screen and color addresses and indexed addressing. (Note: Different opcode conventions are used with the *RUN* assembler, and standard ones are used in indexed addressing.)

```
LN LABEL OPCODE OPERAND COMMENT

--------------------------------
 1         JSR    $E544   CLR/HOME
 2         LDy    #1
 3         LDX    #0
 4         TYA
 5         STA    $400,X
 6         STA    $D800,X
 7         INX
 8         INY
 9         TYA
10         STA    $400,X
11         STA    $D800,X
12         INX
13         INY
14         TYA
15         STA    $400,X
16         STA    $D800,X
17         RTS
```

```
ADRS          OPCODE         OPERAND
49152         JSR            $E544
49155         LDY#           1
49157         LDX#           0
49159         TYA
49160         STA-X            $400
49163         STA-X            $D800
49166         INX
49167         INY
49168         TYA
49169         STA-X            $400
49172         STA-X            $D800
49175         INX
49176         INY
49177         TYA
49178         STA-X            $400
49181         STA-X            $D800
49184         RTS
```

When you activate this program, you'll see that not only are the characters changed, but their colors are also changed. That's because the same value that changed the characters was stored in the color addresses. Whenever you used TYA, you transferred the Y register value to the accumulator. The STA-X stored in the operand address the value that was stored in the accumulator, offset by the value in X. Notice that X started with 0 and Y started with 1; therefore, with each INX and INY, the value of X remained one less than Y.

The X and Y registers can be used as offsets in Indexed Addressing, but you cannot, in the Indexed mode, directly load or store the values in X or Y. It would be necessary first to transfer the X or Y value to the accumulator.

Before continuing, let's do a quick review of the various addressing modes you've used so far:

1. *Immediate*. This mode accesses the actual value in the operand field. It is signaled by the # sign.

2. *Absolute*. This mode accesses the value in the *address* in the operand field. No signal is used; just the opcode and operand. Be careful not to confuse the Immediate with the Absolute mode.

3. *Implied*. This mode addresses one byte opcode with no operand.

4. *Indexed*. In this mode, the accumulator accesses the value in the address in the operand field, *plus* the value in the X or Y register. Address + X/Y register value = Address. Mode is signaled by ,X or ,Y. (– X or – Y are used in the *RUN* assembler.)

Printing Your Source Code

Now that the source code is getting longer, it might be a good idea to start printing it out. This is especially useful for debugging your programs. On your *RUN* assembler, files are saved both as PRG and SEQ files. The object code is the PRG file, and the source code is the SEQ file.

The following program will print your source code from files made with the *RUN* assembler. (If you have a commercial assembler, use its printing function. For example, on the Merlin Assembler, PRTR4 will turn on your printer. Then an L or ASM command from the editor will list it for you.)

```
10 PRINTCHR$(147)
20 DIM A$(255)
30 INPUT "FILENAME ";NF$
40 NA$="==="+NF$+"==="
50 NF$="0:"+ NF$ +",S,R"
60 OPEN9,8,9,NF$
70 INPUT#9,A$(C)
80 PRINT A$(C)
90 C=C+1
100 IF ST=0 THEN 70
110 CLOSE9
120 OPEN4,4
130 PRINT#4,NA$
140 PRINT#4
150 FOR X=0 TO C-1
160 PRINT#4,A$(X)
170 NEXT
180 PRINT#4
190 CLOSE4
```

That's all for now. Next month we'll discuss branching and looping. Combined with indexed addressing, they'll enable you to do just about anything you want very quickly.

Assembler of the Month

MACHINE LANGUAGE DEVELOPMENT SYSTEM

(100 Graydon Hall Drive, Suite 2301,
Don Mills, Ontario, Canada M3A 3A9.)

This month's assembler is an editor/assembler/monitor package from Canada that can be used on either the VIC-20 or C-64. The editor and assembler are not co-resident, since they both load at $A000. The assembler reads text files created with editor, supports macros, error messages, menu selection of editor, assembler or monitor, non-co-resident monitor and built-in copy program for providing backup.

Questions and Answers

Q: What is the best assembler to use when you're getting started?

A: I've found that discussing the relative merits of assemblers is like arguing over religion and politics. Whatever position you take, you'll get an argument. The *RUN* assembler was made for beginners. It was designed for ease of learning, and it is a good way to find out if assembly language programming is your cup of tea.

However, as you program more and more on your own, you will want to get an assembler with an editor, macros and other built-in goodies. My own preference leans toward simple-to-use assemblers that load the editor, assembler and monitor in one single program and save programs as PRG files.

Q: Why bother with hexadecimal numbers? From Basic, all values have to be entered as decimal, and both decimal and hexadecimal numbers work just fine from an assembler.

A: In the next installment of this column, we'll be doing more with indexed addressing, incrementing the address we use as an index. Since the values are "stored" in groupings that make more sense in hexadecimal, in the long run it is simpler to use hexadecimal values.

For example, let's say you increment the value in an address. When that value reaches $FF (255), it "turns over" and starts again, just as the decimal value 99 is "turned over" when 1 is added to it. This is illustrated in the following example.

Decimal

```
00 99 <— Increment by 1
01 00
```

Hexadecimal

```
00 FF <— Increment by 1
01 00
```

Ⓡ

William B. Sanders (8982 Stimson Court, San Diego, CA 92129), is author of Assembly Language for Kids: Commodore 64 *and* Elementary Commodore 64.

NOT COPY PROTECTED! BASICALLY BETTER!

FASTER? EASIER? MORE POWERFUL?

"If languages interest you, this one is well worth a look... It's inexpensive to try. You may find that it's just what you have been looking for."
- *Jim Butterfield, COMPUTE!*

"I can recommend a ***better, faster,*** and cheaper programming language. It's a flashy little European import called ***COMAL***... the most user-friendly language around."
- *Mark Brown, INFO 64*

"...overall ***COMAL*** averages out to about three times faster than BASIC."
- *Loren Wright, MICRO*

"combines some of the best features of languages like Logo, Modula, Pascal, and Ada in an easy-to-use format"
- *AHOY!*

"***COMAL*** was just what I was looking for."
- *Colin Thompson, RUN*

Where else do you get all this...
The complete **COMAL 0.14 System** for Commodore 64™ includes the **Tutorial Disk*** *(teaches you the fundamentals of COMAL)*, plus the **Auto-Run DEMO Disk*** *(demonstrates 26 COMAL programs including games, graphics, sprites and sounds)*, all for just **$7.00.**
You can add the reference book, *COMAL from A to Z*, for just **$4.00 more.**
$7 or **$11** -- either way you're a winner!

COMAL STARTERS KIT
as rated by The Book of Commodores 64 Software 1985.

Overall Rating	A	A	*Reliability*
Ease of Use	A	A	*Error Handling*
Documentation	A	A	*Value for Money*

Published by Arrays, Inc., The Book Division

If you want only the best, get the ***COMAL*** Cartridge Pak.
Includes: 64K ***COMAL*** Cartridge, 2 books, and 5 demo disks*
Over $140.00 value - ***now only $89.95*** plus $4.00 shipping.

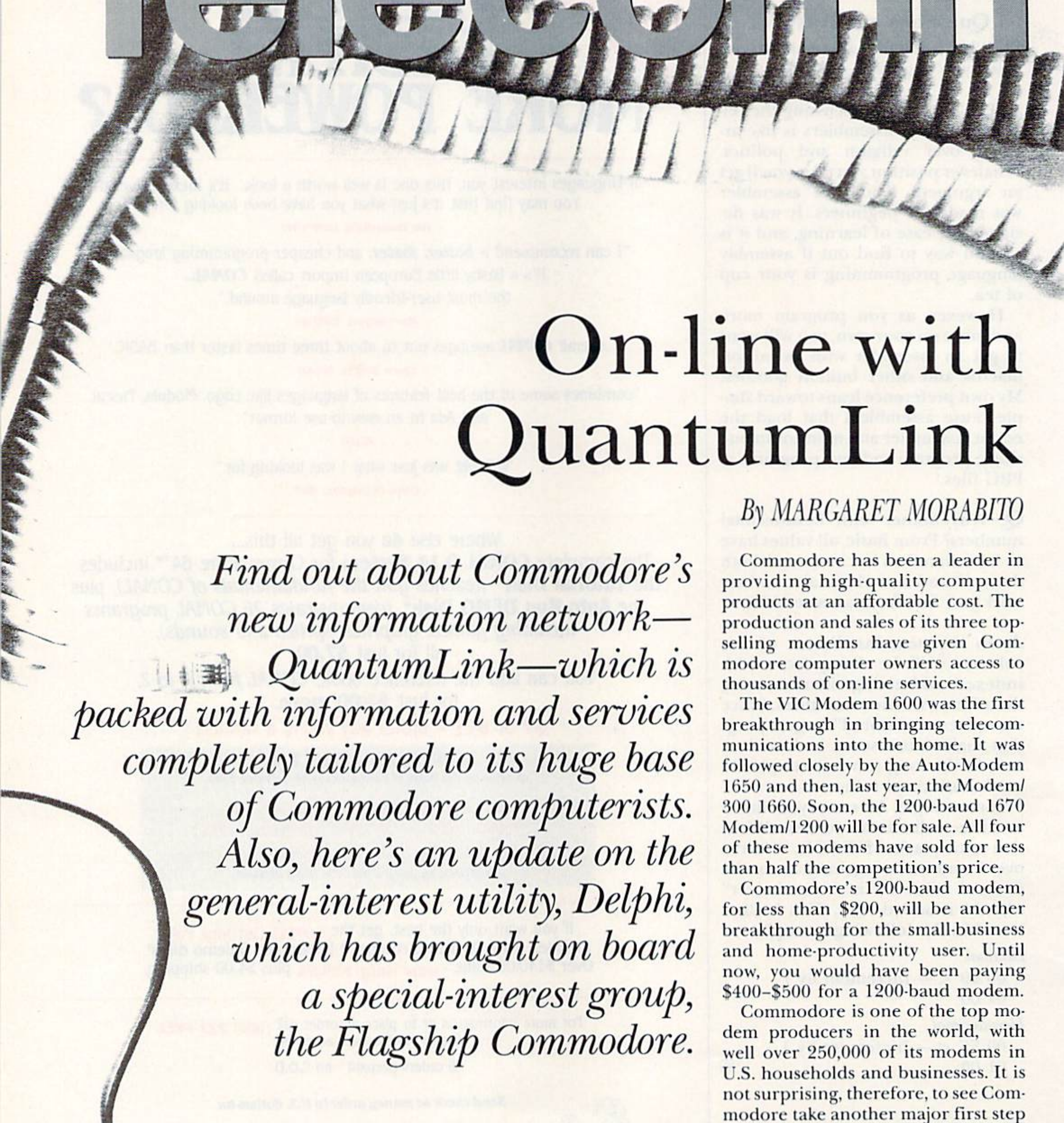
For more information or to place an order call ***(608) 222-4432.***
Visa or Master Card accepted.
All orders prepaid - no C.O.D.

Send check or money order in U.S. dollars to:

COMAL USERS GROUP, U.S.A., LIMITED
6041 Monona Drive, #102, Madison, WI 53716
phone: (608) 222-4432

**Shipments may include 2 disks of programs on 1 double sided diskette.*
Commodore 64 is a trademark of Commodore Electronics

Telecomm



On-line with QuantumLink

By MARGARET MORABITO

Find out about Commodore's new information network—QuantumLink—which is packed with information and services completely tailored to its huge base of Commodore computerists. Also, here's an update on the general-interest utility, Delphi, which has brought on board a special-interest group, the Flagship Commodore.

Commodore has been a leader in providing high-quality computer products at an affordable cost. The production and sales of its three top-selling modems have given Commodore computer owners access to thousands of on-line services.

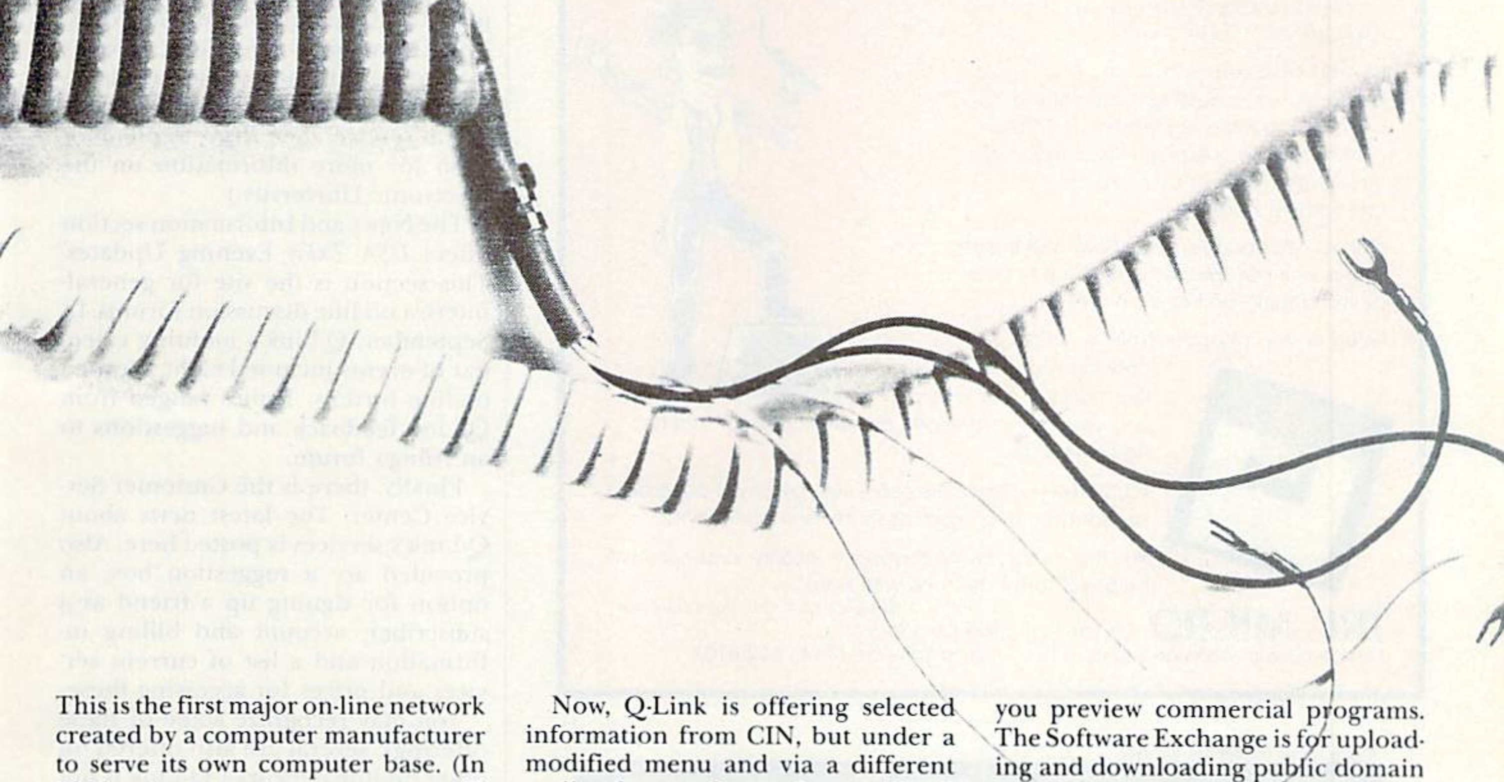
The VIC Modem 1600 was the first breakthrough in bringing telecommunications into the home. It was followed closely by the Auto-Modem 1650 and then, last year, the Modem/300 1660. Soon, the 1200-baud 1670 Modem/1200 will be for sale. All four of these modems have sold for less than half the competition's price.

Commodore's 1200-baud modem, for less than $200, will be another breakthrough for the small-business and home-productivity user. Until now, you would have been paying $400–$500 for a 1200-baud modem.

Commodore is one of the top modem producers in the world, with well over 250,000 of its modems in U.S. households and businesses. It is not surprising, therefore, to see Commodore take another major first step in the telecommunications field.

Commodore has recently introduced an on-line network that is totally tailored to the huge base of Commodore computerists, including the new C-128 and Amiga owners.

unications



This is the first major on-line network created by a computer manufacturer to serve its own computer base. (In 1986, other popular computers will be served by this network.)

The new network is called QuantumLink (Q-Link), and it has been set up by Commodore Business Machines and Quantum Computer Services. Q-Link looks like a blend of PlayNet, CompuServe's Commodore Information Network and more.

Q-Link is designed to be competitive as a stand-alone on-line network. Its goal is to provide ease of use for new telecommunicators, flexibility for more advanced users and low prices for everyone.

Let's take a look at what this new on-line service offers you and how you can subscribe.

What's on Q-Link?

One of the mainstays of Q-Link is the huge amount of information that has been gathered over the years on CompuServe's Commodore Information Network (CIN). In the past, Commodore modems have offered a free subscription to CompuServe, with the recommendation to join CIN. Because of this, CIN is one of the two largest on-line special-interest groups (SIGs) on CompuServe.

Now, Q-Link is offering selected information from CIN, but under a modified menu and via a different on-line format. CompuServe will still retain a Commodore SIG, but it will be different from CIN.

The new CIN section on Q-Link offers the Commodore Computer Tutor, the Weekly Review, Commodore Helpline, User Group Meeting Information, Information About Other Computers and the Commodore Exchange.

One of the new features on CIN is the Weekly Review, which provides an overview of all the noteworthy news items and new programs added to the SIG each week. The Commodore Exchange is the message center where you can share information about your Commodore computer.

There are seven additional sections on Q-Link's Main Menu. The Commodore Software Showcase lets users preview commercial software for their Commodore computers. There are Software Catalog, Software Previews, Software Exchange and File Transfer options.

The Software Catalog lists and describes 2600 commercial programs. (This is beneficial for those who want to find software for a particular subject area.) The Software Preview lets you preview commercial programs. The Software Exchange is for uploading and downloading public domain software. The File Transfer section is for the private exchange of large documents and programs.

Q-Link also offers the People Connection. This section is set up for on-line chatting with other subscribers. In addition, there are electronic mail services.

People Connection also provides a major section devoted solely to telegaming. On-line entertainment has become a prime focus in several on-line networks, and Q-Link subscribers may participate in games for the C-64, C-128 and, in the near future, the Amiga.

(See *RUN*, August 1985, for a look at PlayNet and People/Link, two entertainment networks.)

Another section on Q-Link is called Just For Fun. This section holds contests and trivia quizzes, as well as entertainment news in the form of movie reviews, soap opera summaries, Hollywood Hotline reports and RockyNet Music news.

Q-Link offers on-line shopping, too. The Shopping Center holds a Software Finder, Music Finder, Book Finder, Newsstand and Comp-U-Store On-line. Advertised as coming

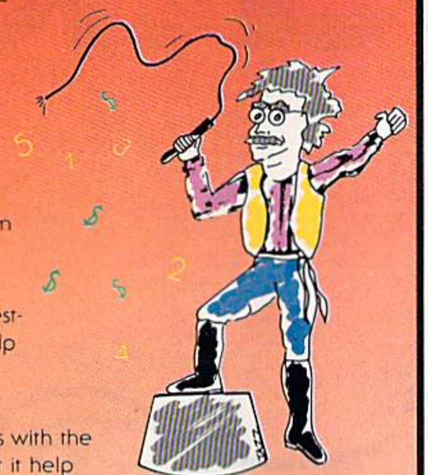
Circle 116 on Reader Service card.

HOW TO
TAME YOUR INFORMATION

TEAM-MATE, WRITE FILE, and HOME OFFICE are fully integrated software programs designed to manage your data so you can whip thousands of names and numbers into shape.

Use the word processor to move a paragraph or transfer text from file to file. You can even generate a form and customize it by merging information from the file manager or by merging spreadsheet numbers.

Monitor your budget, cash flow, and investments with the spreadsheet. Use it to help plan shopping and coupon use.



Keep on top of appointments, critical dates and events with the file manager. Let it help you organize inventories, research notes, or family health records.

PLUS GRAPH creates pie charts, line graphs or bar graphs to illustrate trends, market share, and profitability.

You'll see that the performance, quality, and price will help you tame the facts with ease.

For the C-64™, C-128™, Plus 4™ and Atari™

TRI MICRO P.O. Box 11300, Santa Ana, CA 92711
For more information on where to buy Tri Micro Software (714) 832-6707.

Circle 177 on Reader Service card.

NEW!
Universal Parallel
Graphics Interface

$50 for your old interface

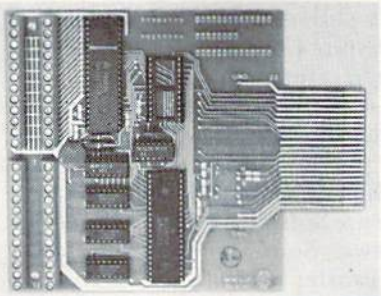
- Built-in self-test with status report
- Optional RAM printer buffer
- Provides virtually total emulation of Commodore printers for compatability with popular software
- ASCII conversion, total test, Emulate & tranparent mode
- Fully intelligent interface that plugs into standard Commodore printer socket
- Exclusive graphic key-match function
- Switch selectable Commodore graphics mode for Epson, StarMicronics, C. Itoh, Prowriter, Okidata, Seikosha, Banana, BMC, Panasonic, Mannesman Talley & others

Micrografix MW-350 .... $129
.... $79.00 with any trade in

Universal Input/Output
Board for C-64 & C-128

- 16 Channel 8-bit A/D converter with 100 microsecond sampling time.
- 1 D/A output
- 16 high voltage/high current discrete output
- 1 EPROM socket
- Use multiple boards for additional channels up to 6 boards

CBM-64 used MW-611 .... $225.00



Dealer Inquiries invited

Micro World Computers, Inc. (303) 987-9531
3333 W. Wadsworth Blvd. #C105
Lakewood, CO 80227

VISA MasterCard

in the near future are national on-line banking, investment service and financial planning services.

Also offered on Q-Link is a Learning Center that holds the American Academic Encyclopedia and the Electronic University Catalog. American Academic Encyclopedia is offered on many of the major on-line networks. The Electronic University Catalog is a listing of all the courses available from TeleLearning's on-line educational service. (See *RUN*, September 1985 for more information on the Electronic University.)

The News and Information section offers *USA Today* Evening Updates. This section is the site for general-interest on-line discussion forums. In September, Q-Link's monthly calendar of events included eight planned on-line forums. Topics ranged from Q-Link feedback and suggestions to an Amiga forum.

Finally, there is the Customer Service Center. The latest news about Q-Link's services is posted here. Also provided are a suggestion box, an option for signing up a friend as a subscriber, account and billing information and a list of current services and prices for accessing these.

You may recognize some of these offerings; several are also offered on other on-line networks. Q-Link is not selling just Commodore-specific information; it is also accumulating a hefty amount of standard features offered on other major networks, like CompuServe, Delphi and The Source. Q-Link is actually providing a PlayNet-like version of these major on-line networks. As a matter of fact, Q-Link is using the same basic software format used by PlayNet.

The Medium

Q-Link is software specific. This means that you will need a copy of its software in order to log on. As with PlayNet, you will get a disk that lets you easily log onto the network and take advantage of the Commodore's color and sound.

I did not receive a Q-Link software disk in time for this article, but I did see a prototype of this software demonstrated at the MARCA (Mid-Atlantic Regional Commodore Association) convention in late July.

When I first saw the prototype, I thought it was PlayNet. There are striking similarities to the PlayNet software, but I have been told that Q-Link software will be more flexible than PlayNet and will allow more user-interaction.

Lyco Computer Marketing & Consultants

SAVE ON THESE IN STOCK PRINTERS

SG-10 .. $208.00

AXIOM SEIKOSHA

GP550AT (Atari)	222
GP550CD (C-64	222
GP700AT (Atari)	439
GP700AP (Apple)	439
ELITE5CD (C-64)	229

C. ITOH

8510Ap+	299
1550P	437
1550BP	437
1550EP	437
1550BCD	469
F10-40	859
F10-55	1039
7500AP	204
7500AR	244

TOSHIBA

P1340	557
P351	1286

CARDCO

32K BUFFER (C-64)	59

CORONA

LP300 Laser Printer	2686
200361 Toner Cartridge	89

EPSON

FX85 (New)	333
LX80	212
FX185 (New)	464
LX90 (New)	226
SQ2000 (New)	1555
JX80	467
Homewriter 10	193
CR-20-Atari	153
CR-220-C-64	153
DX-10 (New)	207
DX-20 (New)	297
HS-80 (New)	288
LQ1500P	975
LQ1500S	1039
RX-100	356
FX-100+	CALL

CITIZEN

MSP-10	269
MSP-15	358
MSP-20	337
MSP-25	495
Sheetfdr (10/20)	189
Sheetfdr (15/25)	199

OKIDATA

Okimate 10	179
Okimate 20	CALL
182	214
192	348
193	563
92P	349
93P	565
84P	645
92 Imagewriter	349

*IBM versions also

BROTHER

HR-15XL-P	359
HR-15XL-S	359
HR-35P	839
HR-35S	839
2024L-P	949
M1009-P	189

JUKI

Juki 6100	347
RS232 Serial Board	55
6100 Tractor	119
6100 Sheet Feeder	209
Juki 6300	757

LEGEND

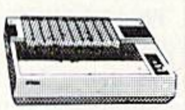
880	188
1080	222
1380	262
1385	296

DIGITAL DEVICES

16K BUFFER	75
32K BUFFER	89
64K BUFFER	125

DIABLO

D25	549
630API	1599
630ECS	1759
D801F	2395
P32CQ1	699
P38	1749
C150	999



1091 ... $233.00

PANASONIC

1091	233
3131 (NEW)	269
1092	373
1093	426
3151 Letter	426
4K Buffer	65

SILVER REED

EXP400	249
EXP500	295
EXP550	399
EXP770	749

STAR MICRONICS

SG-10	208
SG-15	373
SD-10	336
SD-15	442
SR-10	483
SR-15	583
Powertype	303
SB-10	CALL
SG-10C-64 (NEW)	CALL

MONITORS

AMDEK

300 Green	118
300 Amber	128
310 Amber IBM	155
Color 300 Audio	234
Color 500 Composite	369
Color 600	397
Color 700	495
Color 710	569

TEKNIKA

MJ-10 Composite	179
MJ-22 RGB	255

PANASONIC

DT1300D 13" RGB/Composite	247
DTM140 14" RGB/Composite	329
DTH103 10" RGB Hi Res	395
DTS101 10" Composite	175
DT1000G 10" RGB	166
TX12H3P 12" Color	419
TR120M1PA 12" Green	109
TR120MBPA 12" Amber	109
TR122M9P 12" Green IBM	148
TR122MYP 12" Amber IBM	148

X-TRON

Comcolor I Composite Green	177

TAXAN

115 12" Green Composite	CALL
116 12" Amber Copmposite	CALL
121 12" Green TTL	135
122 12" Amber TTL	145
220 14" Color Composite	259
410 12" RGB Hi Res IBM	329
420 12" RGB Super Hi IBM	409
440 12" RGB Ultra Hi Res	555
Tilt Stand	35

PRINCETON GRAPHICS

MAX-12 Amber	185
HX-12 RGB	465
SR-12 RGB	595

SAKATA

SG1000 12" Green	99
SA1000 12" Amber	109
SG1500 12" Green TTL	119
SA1500 12" Amber TTL	129
SC100 13" Color Comp	209
SC200 13" RGB	389
STSI Tilt Stand	29

NEC

JB-1260 Green	95
JB-1201 Green	135
JC 1215 Color	235
JC 1216 RGB	375
JC 1460 Color	265
JB-1205 Amber	139

ZENITH

ZVM 122A Amber	75
ZVM 123G Green	75
ZVM 124 Amber IBM	129
ZVM 131 Color	275
ZVM 133 RGB	389
ZVM 135 Composite	449
ZVM 136 Hi Res Color	589
1220, 1230, 1240	Call

MODEMS

HAYES

Smartmodem 300	133
Smartmodem 1200	377
Smartmodem 1200B	347
Smartmodem 2400	598
Micromodem IIE	135
Westridge (C-64)	59
Mitey Mo Modem	69
Compuserve	19.85

RACAL-VADIC

2400PC	549
2400PA	799
2400V	559

TELE LEARNING

Total Telecommunications (C-64)	29.95
AP-250 (300 Baud Apple)	69.95
IB-250 (300 Baud IBM)	69.95

ANCHOR

Volksmodem	55
Volksmodem 12	186
Mark 12	229

NOVATION

IBM 300/1200 MS-DOS ext.	319
Microbits 1064 Modem	57

DRIVES

INDUS

GT ATARI	199
GT COMMODORE	199

COMTEL

Enhancer 2000 (c-64)	179

MSD

SD1 Drive (C-64)	229
SD2 Drive (C-64)	469

DISKETTES

(Box 10)

DENNISON

ELEPHANT 5¼" SSSD	11.99
ELEPHANT 5¼" SSDD	12.99
ELEPHANT 5¼" DSDD	14.99
PREMIUM 5¼" SSDD	13.99
PREMIUM 5¼" DSDD	15.99

SUNKYONG

SKC 5¼" SSDD	11.99
SKC 5¼" DSDD	13.99

MAXELL

5¼" MD1	13.99
5¼" MD2	19.99

COMMODORE

C-128 NEW	CALL
1571 Drive	CALL
1572 Drive	CALL
1902 Monitor	CALL
1670 Modem	CALL
C-64 Computer	CALL
1541 Drive	189
MPS801 Printer	LOW
1702 Monitor	199

BRODERBUND

The Print Shop	28.75
Graphics Library	18.75
Graphics Library II	19.75
Graphics Library III	19.95
Karateka	19.75
Castles Dr. Creep	19.75
Bank St. Writer	32.75
Loderunner	20.75
Mask of the Sun	24.75
Spelunker	19.75
Serpent's Star	24.75
Whistler's Brother	18.75
Raid Bungeling Bay	18.75

CARDCO

Digitizer Camera	189.95
32K Printer Buffer	59.95
Numeric Keypad	34.95
CB/5 5-slot Board(64)	54.00
CB/2 2-slot Board(64)	25.00
S'More Basic Rom	49.95
Write Now-64	35.00
Mail Now-64	29.00
Spell Now-64	29.00
File Now-64	29.00
Paint Now-64	29.00
Calc Now-64	29.00

MICROPROSE (C-64)

Kennedy Approach	21.75
Crusade in Europe	24.75
Decision in Desert	24.75
Solo Flight	20.75
Nato Commander	20.75
Spitfire Ace	18.75
F-15 Strike Eagle	20.75
Hellcat Ace	18.75

TOLL FREE 1-800-233-8760

MasterCard

TO ORDER

CALL TOLL FREE
800-233-8760
Customer Service 1-717-327-1825

VISA

or send order to
Lyco Computer
P.O. Box 5088
Jersey Shore, PA
17740

RISK FREE POLICY

In-stock items shipped within 24 hours of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO, FPO, and international orders add $5.00 plus 3% for priority mail service. Advertised prices show 4% discount for cash, add 4% for MasterCard or Visa. Personal checks require 4 weeks' clearance before shipping. Ask about UPS Blue and Red label shipping. All merchandise carried under manufacturer's warranty. Free catalog with order. All items subject to change without notice.

The database section and discussion forums are slightly different than PlayNet's. Also, Q-Link provides fast-load functions in its software, so initial access time is only one minute, and movement from one menu section to another is only five to ten seconds. This is significantly quicker than PlayNet's.

Q-Link is using UniNet for most of its telephone-access network. Telenet and Tymnet numbers are provided for certain locations where UniNet is not available. For most users, calling Q-Link will be a free call; however, those of you who live in rural areas will probably be making a long-distance call.

What It Costs

QuantumLink membership is now being offered free to new Commodore modem buyers. Commodore modems will no longer hold subscriptions to CompuServe and the Dow Jones News Retrieval.

Instead, they will hold a disk that holds Q-Link software, one free month of service and an additional general-purpose terminal program that will allow communication with major networks and local bulletin boards. The general-purpose terminal promises to be an improvement over HiggyTerm, which is currently bundled with the Modem/300.

If you already have a modem, you can subscribe to Q-Link and receive its terminal software free. This offer is good until December 31.

You can register on-line for Q-Link service and software by calling 800-833-9400. Once you've made a connection, press the return key twice. You will then be given the option to provide your name and billing information. Within several weeks, you will be receiving the new software.

After December 31, modem owners can buy Q-Link subscriptions and software for $25.

Q-Link is set up on a monthly subscription basis. After your first free month, you will have a $9.95 monthly fee. This gives you free access to most of Q-Link's services; however, as with most on-line networks, there are certain services that will cost you extra, namely, six cents per minute. The first hour per month of surcharged service access is always free.

Q-Link is available from 6 PM to 8 AM on weekdays, and 24 hours a day on weekends. For more information, contact Quantum Computer Services, Inc., 8620 Westwood Center Drive, Vienna, VA 22180; 703-448-8700.

Delphi Update

Since I last reported on Delphi (see *RUN*, July 1985), the service has undergone some changes. For one, Delphi has replaced its old software with a new, more streamlined system. There has also been a major reorganization of services on Delphi. As part of that shift, Delphi has added a brand new service that will be of great interest to Commodore computerists.

A special-interest group (SIG) called the Flagship Commodore is now on Delphi. This SIG started late last spring and is under the management of Deb Christensen, who is a former SYSOP on CompuServe's Commodore Information Network.

Ms. Christensen brings to this new SIG several years' experience in on-line networks and SIG management. She has already generated a lot of activity on the Flagship Commodore, making this SIG a gathering area for many well-informed Commodore computerists. Intermediate and advanced users are at home on the Flagship Commodore, and beginners are welcome.

Flagship Commodore contains a wealth of information. Users have a well-developed forum for on-going discussions. Delphi uses threading, a method of tracking forum messages by topic and for informing you whenever you have a specific reply to a bulletin that you have posted. This threading is one of the strengths of an information network, and it makes the discussions on the Flagship both personal and stimulating.

The Forum is a discussion center where, at times, controversy rages. You can ask questions and get answers from some of the most knowledgeable Commodore users around; you can share your own information; and you can gather information about any topic you can think of that's related to your Commodore computer.

The Forum isn't the only active area on the Flagship. In most good SIGs, much of the on-line activity is spent in the databases, downloading public domain software or archived text files gathered from the forums. The Flagship is still fairly new, but it has a steadily growing database section.

The SIG SYSOPs are constantly checking bulletin boards and user's groups for new public domain software, and there is a constant stream of new software that is being sent on disks to the Flagship. This new software is in addition to the hundreds of programs already available in the public domain.

If you have a program that you've written and would like to contribute to public domain, you can log onto Delphi, enter the Flagship and upload your program. All new programs are placed into a special holding area until the SYSOPs have a chance to check them out.

No copyrighted software is accepted, and the SYSOPs try to avoid duplication of topics. Only after a program has been thoroughly tested and approved does it become a part of the on-line database.

In addition to programs, there are also databases devoted to text files. The threads on the forums are periodically gathered together and archived onto a text database. This makes it easy for the occasional user who doesn't have the time or inclination to read through countless forum messages to follow one topic.

You can just enter the database, locate the topic of your choice, download that file and then read all of the messages while off-line, at your leisure. (By the way, the Flagship has a C-128 and an Amiga section for information exchange on these new computers.)

The Flagship Commodore is one example of how valuable SIGs can be to both new and experienced computerists. It provides an open atmosphere for discussion, information exchange and public software transferral.

All of Delphi's SIGs follow a format similar to the Flagship Commodore. They each offer on-line shopping and electronic mail service from within each SIG. This makes it handy, because you don't have to leave your chosen SIG in order to send or read mail, or to browse through a shopping center.

For more information about Delphi and the Flagship Commodore, contact: Delphi, The Flagship Commodore, General Videotex Corp., 3 Blackstone St., Cambridge, MA 02139; 800-544-4005.

The world of on-line activity is growing rapidly. One area now ready for national access is on-line banking. Next month, we'll look at ViewTron and its contributions in providing banking and other consumer services to Commodore computerists. R

Address all author correspondence to Margaret Morabito, c/o RUN *editorial, 80 Pine St., Peterborough, NH 03458.*

A Cure for the Data Statement Blues

Do your Data statements tell you there are errors in lines that are correct? Now you can get to the real source of these errors and eliminate them quickly.

By DONALD H. GRAHAM

You're running your latest creation (a program that's loaded with Data statements), and suddenly you see this horrible message appear on the screen:

```
?ILLEGAL QUANTITY
ERROR IN 25
```

"Statement 25?" you say. "But that's the statement that reads the data. All it says is READ A. What could possibly be wrong with that?"

Or maybe it happens this way. You type in a program exactly (or so you think), but when you run it, you get this strange message:

```
?OUT OF DATA
ERROR IN 330
```

It's the old data hang-up. The bad piece of data is lost somewhere in that mass collection of Data statements, and the error message tells you that you made a mistake in the Read statement, hundreds of statements away from the real source of the problem.

Great! *Now* what do you do? PRINT A loses its significance, because the variable didn't get filled. And you certainly don't want to proofread all your Data statements! Well, here's what you can do.

In the case of the Out Of Data error, the computer is merely trying to tell you that your program tried to execute a Read command and there was no data left to be read. This is not too serious, since it only means that you've left out one or more pieces of data.

You need to check the allocation of the data and try to find a missing byte or an empty variable. You might also look at your counter value, if you have one. If your Read command is within a loop that executes too many times (even once too many is too many!), then you'll get an Out Of Data error.

You should also be careful not to execute the Read statements more than once. If you do (for example, to play a melody), you must first execute a Restore command. If you don't restore the data pointer before rereading, then the next time you execute the Read command, the pointer will be at the end of your data rather than at the beginning.

Try this to prove an Out Of Data error to yourself. Turn on your computer. Once your screen displays READY, move the cursor up one line and press the return key. You'll get an Out Of Data error, because the computer will have interpreted the Ready prompt as Read Y (remember, Basic ignores spaces unless they are in quotes), and there was no Data statement to read. Now type:

```
20 DATA 235 {RETURN}
```

Next, place the cursor on the Ready prompt and press the return key. Now you don't get an error, because there was data available to be read. As a matter of fact, if you type

```
PRINT Y
```

you'll see the value of Y, 235!

The C-64's central processing unit uses about 830 memory locations to keep track of what's going on in the machine. These locations are referred to as the operating system. To use these locations, you must know what they are, where they are and how to interpret their contents.

In the case of our current dilemma, the Bad Data error, you can type, in the Immediate mode:

```
PRINT PEEK(63) + PEEK(64)*256
```

These two locations (63 and 64) contain a hexadecimal representation (in standard low-byte/high-byte format) of the current Data statement being read. When you hit the return key, your screen will display the number of the last Data statement that the computer was reading before things went awry.

Now you need only list that statement and inspect it for a typo, or a letter where a number belongs, or a value that's too large, or even the elusive double comma.

One final tip: In Basic, don't ever use a comma to denote place value (such as 36,285). If you do, the computer will not treat that comma the way you do. In this example, the computer will either ignore the 285 or (if it's part of a Data statement) will read the 36 as one number, then read the 285 as another number on the next Read command.

So, there you have it! I hope this article has helped to cure your Data statement ailments. R

Address all author correspondence to Donald H. Graham, 125 Cedar Hill Road, Baltimore, MD 21225.

CP/M and the C-128

By ALEX LANE

One of the major features of Commodore's new C-128 computer is its ability to operate in the CP/M mode. CP/M stands for Control Program for Microprocessors, and it's the world's most popular operating system for eight-bit microcomputers.

I can hear some of you hard-core Commodore owners saying, "Hmph! If CP/M is so popular, how come I never read about it in *RUN* before?"

The answer to this question boils down to the fact that CP/M will only work on a microcomputer that is built around an 8080 microprocessor, or one of its more advanced relatives, the 8085 or Z-80. (That's why the Commodore 64, which uses a 6510 microprocessor, can't run CP/M without a hardware attachment that plugs into the back of the machine.)

To date, well over 300 computer manufacturers offer CP/M with their equipment, and new machines are making their debut every day, despite the popularity of IBM-compatible computers and operating systems. In fact, CP/M is so popular that even "advanced" computers like the IBM PC and the Apple Macintosh have options available that let them run CP/M.

How It All Began

The history of CP/M began in 1973 when Gary Kildall, who had earned a Ph.D. in computer science, was working as a part-time consultant to Intel, then and now a leading microchip manufacturer.

Are you familiar with CP/M? Find out what it's all about and how the C-128 opens up a whole new world of software for Commodore users.

Intel, which had been using punched paper tape as a storage medium for software development, wanted a floppy disk interface so that the then new eight-inch Shugart floppy disk drives could be used with Intel's development system for the then state-of-the-art 8080 microprocessor. Kildall was hired to write a high-level software development language for this system.

Kildall used his software development language—called PL/M (Programming Language for Microprocessors)—to write an early version of the CP/M disk operating system, but Intel decided not to adopt CP/M. The company had already started developing its own operating system, called Isis.

By 1975, several small companies were beginning to market 8080-based microcomputer systems to hobbyists. However, many of these companies were faced with having to write a disk operating system so the computers could be used with disk drives.

Among the companies that were first able to get their systems to market were Tarbell Electronics and Digital Microsystems; both companies had licensed CP/M from Kildall's newly founded Digital Research, Inc., and were shipping CP/M with their hardware. Thousands of hobbyists bought the Tarbell S-100 disk controller card (which came with CP/M) and interfaced it to computers having names like Altair, Poly, Vector and SOL.

The rapidly increasing base of CP/M machines made it feasible for software developers to write powerful programming tools and applications programs that would run on a number of different microcomputers with little or no rewriting of code from machine to machine. The development of such software in turn encouraged hardware manufacturers to design and market CP/M-based machines.

Another important development in CP/M history was the formation of first one, and then two, large user's groups. These groups enabled microcomputer users to develop a number of refinements in the system and to solve many implementation problems.

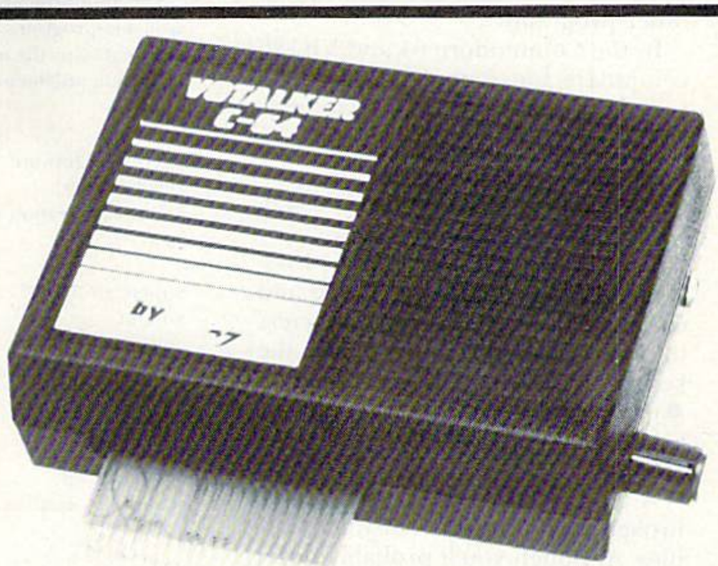
Members also began to place their software efforts in the public domain, with programs ranging from housekeeping utilities and games to word processors, programming languages and telecommunications programs. To date, the CPMUG (CP/M User's Group) and SIG/M (Special Interest Group for Microcomputers) have accumulated several hundred disks of public domain software.

FREE GAME OFFER

VOTALKER C-64

New From Votrax

- Easy to Use — Plug In and Speak
- Clear, Unlimited Speech
- Screen Echo Speaks Words and Symbols
- Character Mode Spells Each Word
- Rate, Pitch and Volume Controls
- Completely ROM Based, No Software to Load
- Self-Contained Speaker



The ultimate speech synthesizer for the Commodore 64.

Also Introducing Trivia Talker II*

- Votalker C-64 Version of Votrax's Popular Talking Trivia Game
- Five Game Categories for Up to Four Players
- Create Your Own Questions and Answers
- Multiple Choice Questions With Timed Responses
- Questions and Answers Displayed and Announced

Special Offer

- Buy Votalker C-64 for **$99.95**
- Get Trivia Talker II ~~**$39.95**~~ **FREE**

Other Votrax Products:

- PSS, T-N-T, Stand-Alone Devices
- IBM, Apple II Plug In Board Synthesizers
- Votrax Speech Chips

votrax®

VOTRAX, INC.
1394 Rankin Troy, Michigan 48083-4074
(313) 588-2050 TWX-8102324140 Votrax-TRMI

Call Votrax at (800) 521-1350

*Trivia Talker I operates only through the Commodore 64 on board SID chip. Price: $39.95

Circle 11 on Reader Service card.

What is CP/M?

CP/M is a single-user, single-task operating system for microcomputers. This means that only one person at a time can use the system to run only one program. "Okay," I can hear many fellow Commodore owners saying, "but what's an operating system?"

An operating system (or OS, for short) is a program that manages computer system resources; things like memory, disk drives, the screen and keyboard (together called "the console," even if physically separate) and the printer and communications ports. In other words, it's a master program that lets you, the user, run other programs.

In the Commodore 64 and VIC-20 computers, for example, the OS consists of three separate, yet interrelated, programs:

● the Basic interpreter, which is a programming language that performs calculations and manipulates data.

● the Kernal, which takes care of system I/O (for example, opening and closing of files, printing characters to the screen, getting input from the keyboard, and so on).

● the screen editor, which intercepts keyboard input and decides what to do with it.

A typical CP/M system can also be broken down into three distinct modules. Although you'll probably never have to poke around inside of them, it's good to know what they are, if only to understand what's being said when you run across a roomful of grizzled CP/M hackers swapping war stories.

The Basic input/output system (BIOS) is a hardware-dependent piece of software that provides the interface between a particular system's nuts and bolts and the rest of the CP/M operating system. This design concept—having a uniform interface despite the actual hardware variations—is the main reason CP/M has been implemented on such a broad range of machines.

In turn, the main module of the CP/M system is the Basic disk operating system (BDOS). It manages the memory, the processor and input/output (or I/O, for short) for the entire microcomputer system. The advantage of using the BDOS is that when a program calls for a file to be opened, say, on a disk, the same results are produced whether you're using a C-128, a Kaypro or an Altair.

Finally, the console command processor (CCP), which, under CP/M

Partial List of CP/M Software For the C-128

It would be fruitless to try to publish the titles of all the commercial software available to users of the CP/M operating system. Such a list would not only be large, but it would require frequent updates, as some packages (such as the now defunct VisiCalc) are retired, and others (like Write-Hand-Man, listed below) are introduced.

The following list of software packages represents an abbreviated cross-section of available programs. Since selection of one title over another is, inherently, a matter of personal taste, the reader should note that the absence of particular titles is not intended as a value judgment.

Multiplan
Microsoft/Hesware
206-828-8080
Second-generation spreadsheet.
$275

SuperCalc 3
Sorcim
408-942-1727
Spreadsheet with modeling and graphics.

DBase II
Ashton-Tate
213-930-1289
Relational database management system.
$700

Quick Code
Fox and Geller Associates
201-882-0121
Program generator for DBase II.
$300

Write-Hand-Man
Poor Person Software
415-493-3735
A "pop-up" utility that includes notepad, phone book, calendar and communication program, among others.
$50

WordStar
Micropro International Corp.
415-499-1200
Long-time bestselling word processor/text editor.
$500

Spellstar
Micropro International Corp.
415-499-1200
Spelling checker.
$250

Spellguard
Sorcim
408-942-1727
Spelling checker.
$100

Plus, can be swapped into and out of memory as needed, provides an interface between the machine and you, the user. Whatever you type into your computer is digested by the CCP, which in turn decides what needs to be done.

In use, the BDOS and BIOS are loaded into high memory in the computer. In addition, the first 256 bytes of memory (the zero-page) are reserved by CP/M for itself. Finally, the memory area between the zero-page and the operating system is called the transient program area, or TPA. When you want to run a program, the code is loaded into the TPA and executed.

As you can see, there are some parallels between the Commodore OS and the CP/M operating system. CP/M's CCP corresponds roughly to Commodore's screen editor; both try to decode keyboard input. The Commodore Kernal's job of managing system I/O is roughly equivalent to the job done by the combination of CP/M's BIOS and BDOS.

There are, however, some differences between the two systems. First, although the Commodore OS includes a programming language (Basic), CP/M does not. In fact, there are only a half dozen or so built-in commands that make sense to the CCP; any other input will result in an error message or cause the system to load and execute a transient command or disk file.

Second, the Kernal does the job of both BIOS and BDOS. Recall that the CP/M, unlike the Kernal, splits up the machine-dependent routines into the BIOS, thus allowing CP/M to be used with many different machines (including systems that are built with equipment bought from different manufacturers).

On a practical level, it's important to remember that CP/M is not a programming language, even though the built-in and transient commands do have their own syntax. CP/M is, by and large, also transparent to the user, so you don't have to be a programmer to use it.

CP/M Plus and the C-128

CP/M has undergone quite a few changes over the years. The version that comes with the C-128—CP/M Version 3.0 (also called CP/M Plus)—is a radical enhancement of its widely distributed predecessor, CP/M Version 2.2.

Although much of the added horsepower of CP/M Plus is intended for

Grammatik
Aspen Software Company
???
Word and sentence analyzer checks style and detects typographical errors.
$??

Word Index II
Borland International
408-438-8400
Numbers, cross-references and indexes lengthy documents.
$200

Mix Editor
Mix Software
214-783-6001
General-purpose text editor that allows split-screen editing and supports macro commands.
$30

Fancy Font
Softcraft, Inc.
608-257-3300
Printer enhancement software soups up dot-matrix printer output.
$180

Crosstalk
Microstuf, Inc.
404-952-0267
Communications program.
$200

Mite
Mycroft Labs
904-385-1141
Communications program.
$150

Turbo Pascal
Borland International
408-438-8400
Pascal programming language.
$50

Abstat
Anderson-Bell Co.
303-275-1661
Statistical applications program.
$400

Power!
Computing!
415-567-1634
Collection of system utilities.
$170

Smartkey
Heritage Software
213-737-7252
Keyboard macro utility, allows keyboard redefinition.
$65

Macro-80
Microsoft
206-828-8080
Macro assembler.
$250

Aztec C II/PRO
Manx Software Systems
201-530-7997
C language compiler.
$350

BDS C Compiler
BD Software, Inc.
617-576-3828
C language compiler.
$150

C/80
Software Toolworks
213-986-4885
C language compiler.
$50

Waltz Lisp
Procode International
800-547-4000
Lisp programming language.
$170

Nevada Cobol
Ellis Computing
415-753-0183
Cobol programming language.
$30

Forth
Laboratory Microsystems, Inc.
213-306-7412
Forth programming language for 8080 or Z80.
$100

Personal Pearl
Pearlsoft
503-682-3636
Program generator.
$295

Disk Doctor
Supersoft, Inc.
217-359-2112
Reclaims damaged disks and re-creates erased files.
$100

Uniform
Microsolutions
815-756-3411
Allows CP/M computers to read different disk formats directly.
$70

programmers and is invisible to the casual user, it's interesting to note that with CP/M Plus on the C-128, you'll have the ability to see and set the date and time, type in multiple commands on a line, use multiple banks of memory (prior versions were limited to 64K of memory) and redirect input and output (allowing you, for example, to get keyboard input from a disk file).

In addition, you'll be able to assign passwords to a disk drive or disk file, so only you can access them, and to set up files so that their contents can't be accidentally changed.

Commodore has also added to CP/M Plus on the C-128 a number of its own enhancements, including the ability to redefine keyboard keys to generate codes or functions and the capacity to make the screen imitate various popular terminals.

And yet, despite all these differences, CP/M Plus on the C-128 will run most of the hundreds of CP/M programs written for CP/M 2.2 and its earlier versions.

Why Run CP/M?

The one major reason to run CP/M is that several hundred megabytes of useful, powerful programs have been written for CP/M machines, and much of this software is either inexpensive or free!

There are public domain accounting packages, database managers, word processors and spreadsheets. There are hundreds of useful disk utilities available, one to match just about anyone's taste. There are thousands of tutorial files available, with information about everything from telecommunications to artificial intelligence.

Are you interested in broadening your knowledge of programming languages? You can try out your knowledge of Pascal, Fortran and Cobol, or get involved with more exotic languages like C, Forth, Lisp, Prolog or Stoic for little or no cost.

And don't forget games! Public domain adventure games; games of skill, like chess; games of chance; games to help you practice Morse code or navigate the ocean; all sorts of games.

Is CP/M for You?

Despite its wide acceptance and use, some "experts" complain that CP/M has some drawbacks for the average personal computer user with limited computer knowledge.

The main objection—that CP/M has a complicated command syntax—does pose an obstacle to new users. At any rate, the command syntax (which does look a little intimidating at first glance) is easily learned. In addition, CP/M Plus addresses the problem of trying to remember the right command at the right time by providing a Help command that displays information on how to use the CP/M Plus commands.

Another related objection is the claim that CP/M forces you to get "into" the machine by having you worry about things like "physical" and "logical" units, where the system resides in memory, and other technical concerns. Not so. Although some undoubtedly consider it a plus to get elbow-deep in bits and bytes, I've known many CP/M users whose most technical accomplishment has been to format a disk, and they're dedicated users, too!

In short, nobody should feel that CP/M is too complicated to learn. With the arrival of CP/M in the C-128, the Commodore user can discover a microcomputing world that has been hidden until now. R

Address all author correspondence to Alexis Lane, 1873 Bartram Road, Jacksonville, FL 32207.

PRE-PUBLICATION ANNOUNCEMENT

Special Issue

The Second Annual **RUN** *Special Issue*

This is simply the most incredible all-in-one Commodore reference library you can buy. It's the ideal gift for every C-64/C-128* enthusiast, and the perfect complement to last year's hot-selling special edition. In fact, last year's *Special Issue* was so popular, all 200,000 copies were sold within a matter of days.

And this year, there are even more reasons to order early. In this exciting *Special Issue*, you'll get:

FREE
The Commodore C-128/C-64 Home Computing Guide
RUN
Special Issue
A CW/CI Publication
THE BEST OF MAGIC
Over 500 Helpful Hints and Tips
BEGINNER'S GUIDE TO
—GRAPHICS
—MUSIC
—TELECOMMUNICATIONS
—CARE AND MAINTENANCE OF THE C-128 and C-64
Special!
FOR NEW C-128 OWNERS
Introduction to CP/M
And Enhanced Basic
DON'T BE BAFFLED BY COMPUTERESE!
Chart to Master Technical Terms
WHERE TO TURN FOR HELP
A Complete List of Clubs and User's Groups

- ■ An in-depth look at the new C-128. . . step-by-step information that leads you through every extraordinary C-128 feature: graphics, music, telecommunications, and programming. Plus, an introduction to CP/M, and a C-128 programmer's aid.
- ■ 500 "Magic" hints and tricks for the C-64 from Louis Sander. . . every entry published in *RUN* in 1985, plus more than 100 *never-before-published tricks* for the C-64 and C-128.
- ■ A *free* pull-out wall chart—even bigger than last year's—containing vital reference material for C-64 and C-128 users. . . keywords, commands, programming codes.
- ■ Learn-as-you-go tutorials for new C-64/C-128 users. . . everything from graphics to maintenance.
- ■ Commodore Primer. . . a glossary of nearly 125 commands and terms.
- ■ A complete, up-to-date list of Commodore clubs and user groups.

Remember, this *limited edition* of *RUN* will be in big demand. Hurry and order your copy. . . and order one for a friend. Simply return the coupon, or call ☎ **1-800-258-5473.** (In NH, dial 1-924-9471.)

FREE Pull-Out Wall Chart Included

> ***"I happened upon your first Special Issue in a bookstore . . . never before have I seen a publication more packed with all the 'right stuff'!"***
>
> *Gregory Stubblefield*
> *San Diego, CA*

YES. *Please send me* __________ *copies of the* ***Second Annual*** **RUN** ***SPECIAL ISSUE.*** *I am enclosing $3.95 for each copy that I order.*

☐ Check Enclosed ☐ MC ☐ VISA ☐ AE

Card # __________ Exp. Date ____ / ____

Name __________ Signature __________

Address __________

City __________ State ____ Zip ____

Canada & Mexico $4.50, Foreign Surface $7.15, US funds drawn on US bank. Foreign Airmail, please inquire. Orders will be shipped December, 1985.

CW Communications/Peterborough, 80 Pine Street, Peterborough, NH 03458 RN-11

---

* Commodore 64 and Commodore 128 are registered trademarks of Commodore Business Machines, Inc.

Circle 189 on Reader Service card.

CUSTOM ROM $19.95

NOW YOU CAN HAVE YOUR COMPUTER POWER UP MESSAGE SAY ANYTHING YOU WANT. IN ANY COLOR YOU WANT.

- Color of Cursor
- Color Of Screen
- Color Of Border
- Choose Up To 31 Letters As Your **Power Up** Message

Also included is the 2 Key Load. Pressing the Shift/Run Stop will load "*", 8, 1.

You can choose from any of these colors: Black, White, Red, Light Red, Cyan, Purple, Green, Light Green, Blue, Light Blue, Yellow, Orange, Brown, Dark Grey, Medium Grey, Light Grey.

P.S. . . . It sure is nice having your own colors and message on the screen on power up!

MASTER LOCK

Here, at last, is a program that will protect your software programs from unauthorized duplicating. 1 to 1 million copies can be protected, fast and easy.

- Specially designed for the C-64 and 1541 Disk Drive.
- Completely encrypts and protects your programs.
- Fully compatible with almost all machine language and basic programs — can even support chained programs.
- Contains a special feature which protects your program from being 'broken.'
- Incorporates all the latest techniques in program encryption and protection.
- Each system has been specially prepared and is unique from all other systems — only **you** are able to make working duplicates of your own protected programs.
- Simple and easy to use — entirely menu drive with prompts.
- Will stop virtually all software copiers from duplicating your programs.
- Fast and reliable protection routine does not take away any useable space from your disk — all 664 blocks are available for use.
- Easy to follow step by step instructions are included on the disk.
- A **must** for all programmers who do not want their programs to be in public domain!

Even the "nibblers" can't copy them. Not even *Disk Maker, *Mister Nibbles, *Copy II, *Ultra Byte or *Fast Hackem. The time to protect you disk is only 5 (five) seconds and each Master Lock makes a different protection scheme. Only

$29.95

*Disk Maker™, Basix
*Mister Nibbles™, Full Circle
*Copy II™, Central Point Software
*Ultra Byte™, Ultra Byte
*Fast Hackem™, Basement Boys Software

TOOL BOX

This disk has over 100 routines, some of them are routines for protection, smooth scrolling, modem routines, and sound and color routines; bootmaker, paddle and joystick; read terminal, auto dial, auto answer. They can easily be incorporated into all of your programs. It is also fully documented. With this disk alone you could build your own program. This disk has a lot of tricks that are used in commercial software.

$19.95

SWIFTERM AND MODEM

This is the best package anywhere!

SWIFTERM:
is absolutely the easiest terminal program available anywhere.

- Works with the 1660, and Westridge Modem
- New printer and midwestern protocal
- Printer dump
- DOS commands access from menu
- Phone book
- Auto dial (with auto redial)
- 29K storage buffer
- Save to disk
- Standard ASCII up/down loading
- 300/1200 Baud

This is an excellent easy to use program for a very reasonable price.

THE MODEM:
Auto dial, auto answer, 300 Baud modem that is 100% compatible with Commadors 1650 modem, so all our software will run with it.

ALL THIS FOR ONLY $35.96

So why buy just another terminal program when you can get a modem, too!?!

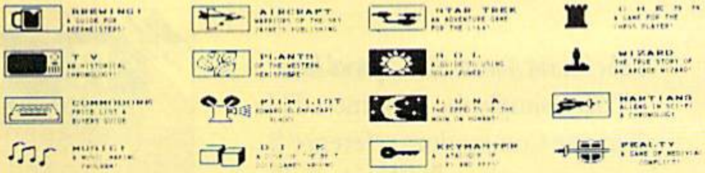
300/1200 BAUD

Modem for the C-64

WITH SWIFTERM $169.00

GRAPHIC LABEL MAKER

Give your labels the professional touch. With Hi Rez Graphics make your own design or use one our 60 premade labels with easy to use on screen editor. You can insert up to three lines of text then choose the picture you want to put on the left hand side of the label. Then you can print out as many labels as you want. This has got to be the neatest label program out there and it's only $24.95



**Also available — the x-rated Graphic package for the 64 and your print shop. There's 60 Hi Rex pictures*

$24.95

1541 M.A.S.H.

Now you can service your own 1541 disk drive using 1541 M.A.S.H. Save big bucks on repair bills. Rate the performance of your drive. Test and adjust RPM's. Test and adjust head alignment. Step by step instructions that anyone can follow. Pays for itself the first time you use it to adjust a misbehaving drive. No knowledge of electronics is necessary. All you needs is a screwdriver and 20 minutes.

NOW ONLY $19.95

DISK TRACKER

Now you can log all of your disks into a neat filing system. Automatically record disk names and program titles. Allows you to quickly scan what you've got. Sorts titles; prints jacket covers; store up to 1600 disk directories on one disk. Search quickly through your entire disk collection for a misplaced program. Works with one drive or two. Fast, easy operation. This program is a must for everyone!

ONLY $19.95

THE XXXXXXXXXX

X-RATED GRAPHICS LIBRARY

Your Print Show May Never Be The Same!

X-Rated Graphics guaranteed to spice up your special letterheads, greeting cards, signs and banners! Everything from mild to Look Out Nelly! 60 Erotic additions to heat up your print shop graphics library, plus 5 ribald Screen Magic additions!

$24.95

Print Shop is a trademark of Broderbund.

GRAPHICS & GAME DISK

X-Rated adventure like you have never seen before. Complete with graphic simulations.

Plus: X-Rated Cartoons

$24.95

HAVE WE GOT A MESSAGE . . . FOR YOU!

Message . . . is a unique graphics integration package which allows you to continuously display hiresolution and multicolor files. Up to 12 files* may be stored in memory and displayed from 1 to 59 seconds each.

Message . . . can use Print Shop 'Screen Magic' files, Flexidraw files, Doodle!, Koala Painter, and more! **Message** . . . even comes with a 'Screen Maker' program to create your own message files!

Use **Message** . . . for advertising displays, titles for home videos, art shows, etc. . . . **Message** . . . even plays background music to accompany displays and you can create your own music files with the 'Music Maker' program.

Also included are 'Graphic Aids' utilities for conversion of different file types, including conversion of Koala Painter files to Doodle! or Print Shop!

The price for all this? Just $19.95 including shipping and handling

**Actual number of files dependent on file complexity.*

Circle 189 on Reader Service card.

MAGNUM LOAD

Programed by Jim Drew

MAGNUM LOAD is a new replacement KERNAL (operating system) ROM chip for your Commodor 65 or 128 computer that will load and verify programs up to 6 times faster than before. The tape routines have been removed from the old chip and in their place have been put a high-speed loader, high-speed verify, and disk driver no-head-rattle routine. Unlike the older cartridge fast loaders, no ports are tied up at the rear of the computer, the screen is not blanked during loading and there is no wear-and-tear on the expansion port. For maximum convenience and performance, the chip is installed directly in the circuit board. Generally a socket has already been provided to make the operation easy, but occasionally some soldering may be required. Now you can give your 1541 disk drive "1571 speed."

Rather than give you more exagerated claims about how many times faster our ROM chip is compared to the slower cartridge versions, a comparison chart is supplied listing MEASURED loading times.

Program	Star-Dos	Reg. Load	Mach 5	Fast Load	MAGNUM LOAD
Pitstop II	?	144 sec.	43 sec.	41 sec.	**31 sec.**
Music Shop	?	105 sec.	105 sec.*	105*	**21 sec.**
Hitchhiker's Guide to the Galaxy	?	70 sec.	70 sec.*	N.G.**	**68 sec.**
On-field Football	?	149 sec.	66 sec.	63 sec.	**56 sec.**
EASY FINANCE I	?	58 sec.	13 sec.	13 sec.	**11 sec.**

$^{\$}24^{95}$

For 1541 or MSD Version

$^{\$}39^{95}$

for Combo Version

*Will not fast load - defaulted back to regular load

**Failed to load at all

D-CODER

- Translates any machine language program into easy-to-ready English descriptions with complete explanations of each command.
- Makes complete notations of all important memory locations accessed by the program (SID, VIC, MOS, KERNAL, etc.)
- Gives you three ways of accessing programs:
  1. **Will read and list programs from DISK**
  2. **Will read and list programs from MEMORY**
  3. **Direct user input (from magazines, etc.)**
- Can be used to locate and examine any machine language program's protection routines!
- Can be used to easily break apart machine language programs for study and examination!
- Printer option for complete hard copy listings!

You no longer need to be an EGGHEAD to read Machine Language.

$^{\$}19^{95}$

N-CODER

THE PERFECT COMPANION PROGRAM TO D-CODER!

Allows you to easily make changes in machine language programs . . . right on the disk!

- Rewrite ability allows code to be altered and then rewritten directly to the disk!
- Features sector-by-sector scrolling assembly language display of machine language programs!
- Notation of ASCII text equivalents for easy spotting of embedded text strings!
- Handy reference display of all assembly language commands and their ML numerical equivalents!
- Byte splitter for easy splitting of decimal addresses into low byte-high byte format!

$^{\$}19^{95}$

SOFTWARE PROTECTION HANDBOOK
Third Edition! Now Available!

If you're **tired** of being harassed by **protected software** and too many **copy** programs, then this is the book for you! This 224 page manual covers the gamut from legalities to protection methods to step-by-step back up procedures. Now you can learn both how to **protect and unprotect** software! The techniques covered include copying cartridges to tape or disk, tape protection, and disk protection. Disk protection covers error numbers 20, 21, 22, 23, 27 and 29 **plus** single track formatting, header modification, header swapping, half track reading and writing, reading and modified bit densities, formatting illegal track/sectors, sync writing and **more!** The Third edition **explains**, tells how to **detect** and how to **write** them with included software.

C-64 Book Only	$^{\$}19^{95}_{\text{US}}$
Book & Disk of all Programs	$^{\$}29^{96}_{\text{US}}$

This manual does not condone piracy

*Shipping: $2.00

'TRACK TRAP' The 1541 Disk Expander!
• Supplement to the Software Protection Handbook •

The most unusual and innovative protection analysis tool for the Commodore yet! — **Not For Beginners** — This system expands your 1541 drive giving capability otherwise only possible for **professional** disk duplication equipment. Now you can create or analyze exotic forms of disk protection. **'D.O.S. Kings' Take Note!'** — Entire tracks of data can be read and written without regard to 'standard' sync and format. You are not longer limited to sector by sector searches. Whole track readouts reveal hidden data even when all or most of the sectors have been erased. Uncovers and writes data under errors, pulse coded sync or data, hidden data and access codes, multiple track densities and more! This supplemental manual covers the complete implementation of the track trap system including necessary software and hardware documentation.

Track Trap disk expanded manual	$^{\$}9^{95}_{\text{US}}$

Top Secret Stuff I and Top Secret Stuff II

Programed by Jim Drew

Are both collections of 20 programs per diskette (that works out to about $1.00 per program!) that help you explore and enhance your Commodore 64 and/or 128 and 1541 disk drive. Now you can unlock many secrets formerly known only to top machine language programmers by using these sophisticated "tools." If you have ever been curious about the inner workings of your computer system, now is your chance to dig in and find answers with the help of these programs. These collections of programs have gotten rave reviews from actual users, and we are sure that you, too, will be pleased.

The programs include on each diskette are listed below

TOP SECRET STUFF I

The Dock (view/repair disk contents)
Sync Checker (diskette)
Imbedded Track Number Creator
Disk Manipulation System
3 Minute Copy (backup program)
Diskette Matcher (compare sectors)
Unscratch A File (recover file)
View BAM (block allocation map)
1541 Read/Write Test
½ Track Reader
Header Reader (display disk header)
Sync Maker
Device Number Change (disk drive)
Electronic Arts Backup
Drive Mon (disk drive m/1 monitor)
Diskette File Log (start-end address)
Write-Protect Sensor Test
Repair A Track (recover data)
Fast Format (10 seconds)
½ Track Formatter

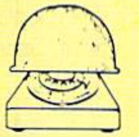
$^{\$}19^{95}$

TOP SECRET STUFF II

RAM Test (test Computer RAM)
Copy $AOOO-$FFFF (under ROMS)
Display G.C.R. (All sector data)
Un-Write Protect (diskette)
Unnew Program
Wedge - $8000
Smooth Scroll (messages up screen)
Koala Dump (koala pad screen dump)
Disk Manipulation System
Disk Eraser (20 second clean wipe)
Split Screen (TWO screen colors)
Disk Protection System (stops copies)
Write Protect (diskette)
Boot Maker (autobook BASIC programs)
Wedge - $COOO
Diskmatcher II (high speed version)
No Drive Rattle (on reading errors)
3 Times Disk Drive Head Speed
Monitor Test (check video monitor)

$^{\$}19^{95}$

WAR GAMES AUTODIALER



1. **Auto Dial** will automatically dial a set of numbers you choose.
2. **Review Numbers** will review numbers that were answered by a computer.
3. **Save Numbers** will save numbers where a computer answered.
4. **Hardcopy of Numbers** will print out list of numbers where a computer answered.
5. **LOAD Numbers** will load in numbers to continue where it left off.
6. **Continue** will pick up dialing where it was interrupted.

$^{\$}29^{95}$

BBS

- 300/1200 Band
- Remote access for sysop
- 2 levels of security for up and down load
- 7 rooms (read and write) with 4 security levels
- Secret highest level
- Open chalk board
- Auto message cycling
- Printer option

Plus the only BBS with all three (3) proticals X modem, new printer and midwest term, so anyone can up/down load.

Don't be fooled by cheap imitations. This is the most comprehensive system available anywhere. Now at a new low price.

$^{\$}39^{95}$

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders. Canada orders must be in U.S. Dollars. VISA — MASTER CARD — C.O.D.

Programs for C-64 $2.00 S & H on all orders

Software Submissions Invited

VISA

MasterCard

MegaSoft Limited

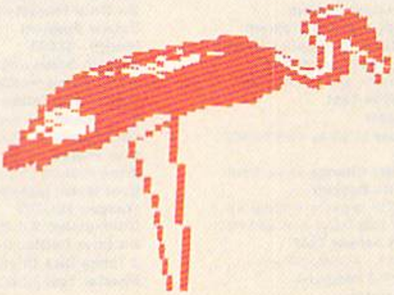
P.O. Box 1080, Battle Ground, Washington 98604
Phone 800-541-1541 • BBS 687-5205 After Hours Computer to Computer (BBS)

ReRUN's WINTER EDITION

Just Imagine It.

Then Watch It Come True!

Turn your great ideas into reality with **ReRUN's Winter Edition***—our most creative software package yet! You'll get more than a dozen programs for the C-64/C-128 (in C-64 mode)** that will help you create everything from an essay or term paper to a novel piece of art!



Programs That Get Results

Does your mind paint a picture faster than you can sketch it? Then try "High-Spirited Sprites", a utility that lets you rapidly draw, animate view, and save sprite graphics!

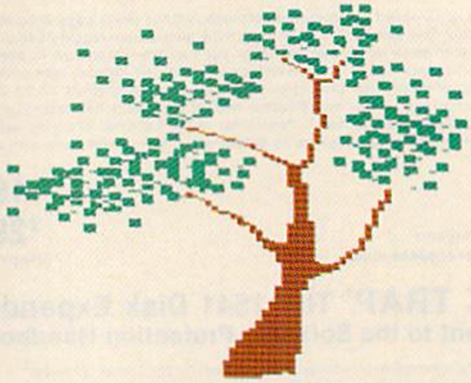
You can even create, save, load, and print colorful screens with three easy-to-use programs: "Screen Maker," "Screen Viewer," and "Screen Booter"!

Have you been dreaming up an interesting approach to a term paper or feature article, but the pieces just won't fall together? Then you'll love "Brainstorming," a thought-processing program that classifies your thoughts into groups and then prints an outline of your idea.

Or, if music is your specialty, you'll enjoy "Make a Little Music," a utility that lets you create, save and load songs into your own programs by using a joystick!

Programs with Variety

And that's just the beginning! **ReRUN's Winter Edition** also has programs to print your checks and teach you the fundamentals of assembly language, as well as **RUN**'s new checksum proofreader, for accuracy in typing in programs.



Of course, every **ReRUN** cassette and disk is in ready-to-run format, which means you can enjoy each top-quality **RUN** program without time-consuming keyboarding or debugging. Your **ReRUN Winter Edition** comes complete with a booklet of easy loading instructions and documentation.

Why not start bringing your great ideas to life today? Get creative! Get the **ReRUN Winter Edition!** Cassettes are $11.47, and disks are just $21.47. Make your choice, and then return the coupon or attached order card with payment. Or, call **1-800-258-5473.** (In NH, please dial 1-924-9471.)

YES! **I WANT TO BE MORE CREATIVE!** Please send me the ReRUN Winter Edition.

☐ Cassette $11.47 ☐ Disk $21.47

☐ Payment Enclosed ☐ AE ☐ VISA ☐ MC

Card # Exp. Date

Signature

Name

Address

City State Zip

11-85

Please Allow 4–6 Weeks for Delivery

ReRUN
80 Pine Street, Peterborough, NH 03458

Screen Maker, Screen Booter, High-Spirited Sprites, Graphics Display System, Wedgemaker, Commodore Helps Pay the Bills and many more.

* Available December 1985

Note some programs on disk only.

** C-64 and C-128 are registered trademarks of Commodore Business Machines, Inc.

Instant Recall

By RICK LOCKETT

Here's a program that should have been included in your Commodore user's manual. Designed to work on both the C-64 and VIC-20, Instant Recall is a short (only six lines) and speedy data-access program.

Client on the phone? With Instant Recall, you can have his file on the screen by the time he has told you his name. The program also saves you a lot of unnecessary typing.

For example, if your client's name begins with S, simply type S and hit the return key. Every name in the file beginning with S will be displayed. If you type SMI, then every name that begins with SMI will appear.

It is seldom necessary to type in more than the first few letters of an item in order to find a particular entry, and this is one reason for the program's speed. This process is the same whether you're using Instant Recall for a client file, as an inventory or for keeping track of recipes.

If you own an unexpanded VIC-20, you'll especially appreciate the minibyte that Instant Recall puts on your FRE(X). You need that memory for information, rather than for a program that sorts and retrieves information.

■

Conserve memory with this quick and easy miniature information retriever.

■

The Program

Here's the simple version of Instant Recall:

```
2 RESTORE:INPUT A$
3 B = LEN(A$):READ B$
4 IF LEFT$(B$,B) = A$ THEN PRINT B$
5 IF B$ = “0” THEN GOTO 2
6 GOTO 3
999 DATA 0
```

Now enter the following sample data entries and run the program. You'll quickly discover its advantages.

```
10 DATA CARR TERRY – UNIVERSE 3 –
   ANTHOLOGY – 1973
11 DATA CLARKE ARTHUR C –
   RENDEZVOUS WITH RAMA–
   NOVEL – 1973
12 DATA CAMUS ALBERT –
   THE STRANGER – NOVEL – 1942
13 DATA CORDER JIM W – HANDBOOK OF
   CURRENT ENGLISH – REF – 1981
14 DATA COPPEE HENRY –
   ELEMENTS OF LOGIC – REF – 1857
```

These entries are titles of books from my shelf and should give you a good idea of how Instant Recall works. (If you happen to own a bookstore, you can readily see how quickly you could check your inventory for a customer.)

The refinements that might be added to this program are endless, as are its potential applications. To save bytes, you should use some abbreviations in your data entries. Also, it is a good idea to include (somewhere) the line number, so that you can easily update or eliminate an entry. Since the computer has a key that will clear the screen, I didn't include a CLR command in the program. Since you really can't tell how long you may want the display to remain on your screen, it's best to simply avoid it in the program. R

Address all author correspondence to Rick Lockett, Box 439A, RD #6, Lewistown, PA 17044.

RUN It Right

C-64; C-128 (in C-64 mode); VIC-20

Please Send Me The Following Back Issues of ReRUN:

☐ **ReRUN Vol. I**—Includes: Function Keys, Database Deluxe, Funky Monkey, Mad Bomber, Baja 1000, Canyons of Zelaz. (Programs run on C-64 and/or VIC-20.)

☐ **ReRUN Vol. II**—Includes: Datafile, Speller, NFL Football, Mystery of Lane Manor. (Separate media for C-64 and VIC-20. Please specify when ordering.)

Special Offer!

☐ **Buy Both Vol. I AND Vol. II—SAVE $5!**

* 2 Cassettes $17.94 * 2 Disks $37.94

☐ **Spring Edition**—Includes: †Tax Records 64, †CalcAid, °Quatro, and †Fly The Grand Canyon. (Runs on C-64, VIC-20, and/or C-128. Separate media for C-64 and VIC-20. Please specify.)

☐ **GAMEPAK***—Features never-before-published games: Ski, †Hassle Castle, and †Lava Pit. Plus, **RUN** favorites like Find The Word, and Tag. (Runs on C-64, C-128.)

☐ **Summer Edition***—Includes: Sound Effects, †Joystick Artist, †Play Ball, and Money Manager. (Runs on C-64, C-128.)

☐ **Fall Edition***—Includes: Home Run Derby, Turtle Graphics, Big Letters, Function Keys, Test Maker, Flynn's Gold, Disk Doctor, and more! (Runs on C-64, C-128.)

† Available on disk only.
° Available on C-64 version only.

☐ C-64 ☐ VIC-20
☐ Cassette $11.47** each
☐ Disk $21.47 each
☐ Payment enclosed ☐ AE ☐ Visa ☐ MC

Card # ____________________

Exp. Date ____________________

Signature ____________________

Name ____________________

Address ____________________

City ________ State ________ Zip ________

Disks contain more programs than cassettes.
* Not available for VIC-20
**Prices include postage and handling
Some programs will also run on Plus/4.

80 Pine St. • Peterborough, NH

11-85 B.I.

If Your ReRUN Library Is Incomplete,

Your favorite programs from RUN
RE RUN
VOLUME I
RE RUN
Spring Edition 1985
Special Edition
RE RUN
GAMEPAK
A special collection of RUN's best games!
Summer Edition 1985
RE RUN
The Best Programs From RUN
For the C-64, C-128 and Plus/4

Fill In The Blanks!

Missing any of these hot-selling back issues of ReRUN?

- ReRUN Vol. I
- ReRUN Vol. II
- GAMEPAK
- Spring Edition
- Summer Edition
- Fall Edition

It's not too late to catch up! While quantities last, you can get every **ReRUN** ever published. Enjoy the most popular RUN programs on cassette or disk! It's as easy as filling out the coupon, or calling **1-800-258-5473**. In NH, dial 1-924-9471.

Wedgemaker

Why settle for Commodore's wedge? Now, you can easily create your own tailored wedge, which holds only those commands you use most.

By ALEJANDRO A. KAPAUAN

Wedgemaker is a utility program that allows you to add your own custom Direct mode commands to Basic without having to write a single line of machine code. Since you implement the commands in the Basic language itself, you can quickly and easily add new and arbitrarily complex functions that would normally take a lot of time to write in assembly language.

I'll examine a sample Basic program and show you how to convert it into a useful disk wedge. But first, let's go through the step-by-step procedure in using Wedgemaker.

Before anything else, you'll need Wedgemaker itself. Type in Listing 1 very carefully, check your work and save the program on disk with the name Wedgemaker.

Listing 2 is a sample program containing a few useful disk and number-conversion utilities. This program will serve as the sample wedge. Later, you may utilize it as the basis for your own personally designed wedge. For now, however, I suggest that you type it into your computer exactly as shown, without modifications. Again, exercise care in entering it and save it on disk with the name Utilities.

There are nine program segments in Listing 2. Line 20 is the start of the segment that reads the disk error channel. With the program in your computer, try typing in GOTO20. That section of code will run, and the message from the disk will be printed to the screen.

A decimal-to-hexadecimal number-conversion program begins at line 60, while a hexadecimal-to-decimal program begins at line 110. These lines prompt you for numbers to convert; to discontinue these prompts, respond only by pressing the return key. Try typing in a GOTO60 or GOTO110 to run the programs.

Similarly, line 160 starts a routine that initializes the disk drive. At line 200 and line 240 are programs that scratch and rename disk files. Line 280 is the beginning of a program that formats a new disk, while at line 330 is a program that prints the disk directory to the screen. All these program segments are prompt-driven. Using them is much easier than having to remember a lot of lengthy disk commands.

Finally, at line 530 is a program that will later serve as a Help routine. It prints a list of commands that will be available with the wedge. You'll see later how nicely this works out.

Wedgemaker at Work

Now you'll perform some magic. Load the program called Wedgemaker and run it. It will print a banner line and prompt you with the question

```
PROGRAM FILE?
```

With the Utilities disk in your drive, type UTILITIES and hit the return key. Wedgemaker will now read the directory entry for the file and determine the program's length, in blocks. Each block constitutes approximately 256 bytes. The length of the program will be reported, then you'll be asked the question

```
#DATA PAGES?
```

Wedgemaker is asking you how many blocks to reserve for variables, arrays and strings in the wedge program. For the sample program, two blocks are more than sufficient. Enter the number 2, then hit the return key. For your own wedge program, you'll have to estimate the disk storage space needed. I'll give you a procedure to do this later.

Wedgemaker will then lower the Basic top-of-memory pointer, load the program in high memory and relink the pointers in the program for its new location. Next, it will add a machine language program that will manage the Basic wedge program.

You will then be asked to define the commands you want to add to Direct mode Basic. For the sample program, nine new commands will be defined, one corresponding to

RUN It Right

C-64; C-128 (in C-64 mode);
VIC-20 with at least 8K expansion
1541 disk drive

each of the program segments previously described. For each command, you enter a command name and a line number. As a guide, the following table lists the command names and their corresponding line numbers for the sample program.

Command	Line
ERR	20
HEX	60
DEC	110
INIT	160
SCRATCH	200
RENAME	240
HEADER	280
DIR	330
HELP	530

The names I have given the commands are arbitrary, so you may give them other names. However, for the sake of consistency with this article, I suggest you use those in the table for your first try.

When you are asked for command 1, enter ERR and hit the return key. When you are asked for the line number, enter 20 and hit the return key. Enter the other commands and line numbers listed in the table. When you are done, just hit the return key when you are asked for the next command. You will be asked the question

```
OKAY (Y/N)?
```

If you made any mistakes in entering the commands or line numbers, then answer N, and you can enter them again. If everything is satisfactory, then answer Y.

Now, insert into your disk drive the disk on which you want to save the wedge program. You will be asked for the name you want to give the wedge. For our example, let's just call it Wedge. Type WEDGE and hit the return key. Two files will be saved to disk. One will be called WEDGE.W, which is the actual wedge program file. The other, called WEDGE, is a command file that will help you load the wedge easily. It is in this latter file that Wedgemaker will report the commands it has placed.

Once Wedgemaker has created your wedge, you're ready to use it. With the disk containing the wedge in your drive, enter the command

```
LOAD"WEDGE",8,1
```

This will then load the binary file WEDGE.W into memory and perform the Pokes necessary to protect it and install the wedge. When the wedge is loaded, try out your new commands.

You must type in the commands

MUST LIQUIDATE
COMMODORE COMPATIBLE
BELL & HOWELL DOT MATRIX
COMPUTER PRINTER
AT BELOW DEALER COST!

FACTORY NEW! FIRST QUALITY!

PUBLIC NOTICE
INTENSE COMPETITION IN THE COMPUTER INDUSTRY LEADS TO UNPROFITABLE LINE FOR BELL & HOWELL
C.O.M.B. authorized to liquidate recent model printers at BELOW dealer cost!

Bell & Howell Model P-100 Made in U.S.A.

- Fast, 100 characters per second! (for faster model, see below.)
- Heavy-duty for constant use on big jobs!
- Compatible with Commodore 64 & SX64!

Size: 16" W x 10½" D x 6" H
Weight: 15 lbs.

Save hundreds of dollars on a top name brand!

Here's a sensational value on a fast-operating, excellent quality, heavy-duty printer. It INCLUDES an interface for hookup to your Commodore 64 or Commodore SX64.

Compared to many competitive models, THESE printers are FASTER! Virtually trouble-free. Built to handle BIG office jobs. The P-100 has a memory which allows data storage WHILE the printer is running! And it can print in a variety of type styles, from large and bold to small and light!

Other special features include: Easy loading, long-life cartridge ribbon. Crisp printing. And, with your purchase, you get a TOLL-FREE phone number to call for useful tips or questions you might have.

CHARACTER SET: Full upper and lower case 96 character ASCII set with descenders and underlining. Software selectable single or double wide character fonts. GRAPHICS: High resolution dot addressable graphics.

PRINT FORMAT: 8" line length; 80 characters per line at 10 CPI; 136 characters per line at 17 CPI.

PAPER SLEW (ADVANCE): 10 lines per second, stepper motor controlled. User selectable pressure roller or tractor feed.

DATA INPUT: Parallel. Centronics type 7-bit ASCII. TTL level with STROBE. ACKNOWLEDGE returned to indicate data was received. SERIAL: RS232C. With BUSY handshake. 10 or 11 bits: 110, 150, 300, 1200 Baud. INPUT POWER: 115 volts.

PRINT RATE: 100 characters/second. Data Buffer: 1K (Optional expandable to 2K).

OPERATIONAL CONTROLS: Power on/off, set top of form, select/deselect, line/forms, feed.

MEDIA: Roll paper: 8½"W x 5" dia. single ply or pressure sensitive multiple copy paper. .012" max. thickness. Fan fold paper: 1" to 9½" sprocket (including sprocket margins). .012" max. thickness.

CUT SHEET PAPER: max. width. 9½".

TYPE OF PRINTING: Impact bidirectional, 7x9 dot matrix for data printing, 11 x 9 matrix for correspondence printing.

RIBBON: Continuous loop cartridge, 20 yards by 1/2" ribbon, 5 million character life.

90 Day Limited Factory Warranty on Printer Parts and Labor!

Mfr. List Price (with interface) $644.95

Includes Commodore Interface! Price Now Only: $238
Item H-870-63327-10 Ship, handling: $10.00

HI-SPEED MODEL P-150
150 characters per second!
Same specifications as P-100 above, but with following special features: Tractor feed. 2K data buffer (optional: expandable to 4K and/or 68K). Paper advance of 20 lps. 14⅛" maximum paper width. Impact logic seeking printing. 50 yd. loop cartridge ribbon: 10 million characters. Size: 23" W x 15½" D x 7½" H. Weight: 25 lbs. Interface included. $288
Item H-870-63327-11 Ship, handling: $14.00

Price subject to change after 60 days.
Sales outside continental U.S. are subject to special conditions. Please calll or write to inquire.

VISA MasterCard
Credit card members can order by phone, 24 hours a day, 7 days a week!

Toll-Free: 1-800-328-0609

TeleCheck
Your check is welcome!
No delays when you pay by check!

C.O.M.B. CO.®
Authorized Liquidator
14605 28TH AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55441-3397

C.O.M.B. CO.® Item H-870
14605 28th Ave. N./Minneapolis, MN 55441-3397
Please send items indicated below. (Minnesota residents add 6% sales tax. Allow 3-4 weeks for delivery. Sorry, no C.O.D. orders.)
___P-100 Printer(s) with interface at $238 each plus $10.00 each for ship, handling: Item H-870-63327-10
___P-150 Printer(s) with interface at $288 each plus $14.00 each for ship, handling: Item H-870-63327-11
☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)
Charge my: ☐ MasterCard™ ☐ VISA
Acct. No.______ Exp.______
PLEASE PRINT CLEARLY
Name______
Address______
City______
State______ ZIP______
Phone______
Sign here______

starting at the first column of the line, and you cannot combine them with any other Basic statement on the same line. Try typing in the Help command. A list of available commands will appear on the screen. Try the other commands. Notice that if you type in the List command, no program will be listed. As far as Basic is concerned, the wedge program does not exist. You can even load into your computer some other Basic program, and the "invisible" wedge Basic program will still be there.

At this point, you will notice that you have less free memory than normal. This is because the top-of-memory pointer has been lowered to protect the wedge program.

Hints

There are three peculiarities about the way the Wedgemaker program works. First, for the wedge to work, you must begin your program with a REM statement as in the program in Listing 2. You cannot use this line as the start of any command definition. Look back at the table of commands and note that the first command is ERR, which starts at line 20.

Second, variables within the wedge Basic program retain their values after Wedgemaker executes a command. Many applications where one command may require the result of a previous command can take advantage of this feature.

Third, there is a limited table space available in Wedgemaker. Each of the defined command strings can be no longer than 256 bytes. This limits you to only about 23 or so commands, depending on the length of the command names.

Estimating Disk Storage Space

To determine the number of blocks needed by your own wedge program for variables, just run the routine you think uses the most strings or variables. Immediately after that, check how much memory you have left by typing PRINT FRE(0). Then clear the variables by typing in the CLR command. Type PRINT FRE(0) to check your free memory again. The difference in these two numbers is the number of bytes used by the variables. To convert to blocks of memory, just divide by 256 and round up to the next larger integer. It is a wise idea to add one extra block to prevent any Out of Memory error while a wedge routine is running.

Finally, I'd like to say that Wedgemaker is not limited to making just wedge programs. You can string several Basic game programs together, then use Wedgemaker to turn this large program into a game wedge. Amaze your friends by simply typing in the name of a game to get it running. Or use Wedgemaker to develop built-in Basic database commands. Wedgemaker's applications are virtually limitless, so let your imagination run wild. Ⓡ

Address all author correspondence to Alejandro A. Kapauan, 141–6 Airport Road, West Lafayette, IN 47906.

Listing 1. *Wedgemaker program.*

Note: VIC-20 users disregard the checksums. Do not type in the REMs at the end of the program lines.

```
10 PRINT"{SHFT CLR}{CTRL 9}*** WEDGEMAKER *
   **":PRINT"INSERT PROGRAM DISK"   :REM*102
20 Z$=CHR$(0)                         :REM*16
30 F$="":INPUT"PROGRAM FILE";F$:IFF$=""THEN
   30                                :REM*218
40 CLOSE5:CLOSE6:CLOSE15:OPEN15,8,15:OPEN5,
   8,5,"0:"+F$+",P,R"                :REM*240
50 GOSUB730:IFER<>0THENCLOSE5:CLOSE15:GOTO3
   0                                  :REM*84
60 GET#5,A$:GET#5,B$:POKE828,ASC(A$+Z$):POK
   E829,ASC(B$+Z$):CLOSE5             :REM*50
70 OPEN6,8,0,"$0:"+F$:GET#6,A$,A$,A$,A$,A$,
   A$                                :REM*156
80 GET#6,A$:IFA$<>CHR$(34)THEN80      :REM*54
90 GET#6,A$:IFA$<>CHR$(34)THEN90      :REM*80
100 GET#6,A$:IFA$=CHR$(32)THEN100     :REM*72
110 GET#6,A$:IFA$<>""THEN110          :REM*48
120 GET#6,A$,A$,A$,B$:L=ASC(A$+Z$)+256*ASC(
    B$+Z$)                           :REM*230
130 CLOSE6:CLOSE15:PRINT"PROGRAM IS"L"PAGES
     LONG"                           :REM*146
140 INPUT"#DATA PAGES";P:P=INT(P):IFP<1THEN
    140                              :REM*216
150 A=831:FORI=1TOLEN(F$):POKEA,ASC(MID$(F$
    ,I,1)):A=A+1:NEXTI:POKEA,0        :REM*64
160 POKE830,L+P+2:POKE56,PEEK(56)-L-P-2:CLR
                                      :REM*12
170 Z$=CHR$(0):P=PEEK(830):F$="":A=831
                                      :REM*60
180 C=PEEK(A):IFC<>0THENF$=F$+CHR$(C):A=A+1
    :GOTO180                          :REM*12
190 PRINT"LOADING "F$                 :REM*80
200 OPEN15,8,15:POKE183,LEN(F$):POKE184,5:P
    OKE185,0:POKE186,8                :REM*50
210 POKE187,63:POKE188,3:POKE780,0:POKE781,
    PEEK(55):POKE782,PEEK(56)+2       :REM*78
220 SYS65493:T=PEEK(781)+256*PEEK(782):GOSU
    B730:IFER<>0THENSTOP             :REM*168
230 CLOSE15:PRINT"LINKING "F$:A=PEEK(55)+25
    6*(PEEK(56)+2)                   :REM*174
240 B=PEEK(828)+256*PEEK(829):C=A    :REM*200
250 V=PEEK(A)+256*PEEK(A+1):IFV=0THEN270
                                     :REM*146
260 V=V-B+C:POKEA,V-INT(V/256)*256:POKEA+1,
    INT(V/256):A=V:GOTO250           :REM*149
270 PRINT"APPENDING ML"              :REM*221
280 S=0:FORI=828TO875:READV:S=S+V:POKEI,V:N
    EXTI                             :REM*247
290 IFS<>5045THENPRINT"ERROR IN DATA BLOCK
    1":STOP                           :REM*29
300 POKE842,PEEK(771):POKE873,PEEK(771)
                                     :REM*121
310 C=C-512:S=0:FORI=0TO127:READV:POKEC+I,V
    :S=S+V:NEXTI                     :REM*239
320 IFS<>14688THENPRINT"ERROR IN DATA BLOCK
     2":STOP                         :REM*245
330 S=0:FORI=1TO12:READA:S=S+A:READV:S=S+V:
    A=A+C+1:V=V+C                    :REM*139
340 POKEA,V-INT(V/256)*256:POKEA+1,INT(V/25
    6):NEXTI                         :REM*115
350 IFS<>1949THENPRINT"ERROR IN DATA BLOCK
    3":STOP                          :REM*231
360 POKEC+57,PEEK(771):A=PEEK(770)+256*PEEK
    (771)                            :REM*203
370 POKEC+9,PEEK(A+1):POKEC+10,PEEK(A+2)
                                     :REM*245
380 FORI=105TO128:POKEC+I,0:NEXTI    :REM*151
390 POKEC+105,PEEK(55):POKEC+106,PEEK(56)+2
                                     :REM*147
400 T2=INT(T/256):T1=T-T2*256        :REM*107
410 FORI=107TO111STEP2:POKEC+I,T1:POKEC+I+1
    ,T2:NEXTI                        :REM*161
420 C1=PEEK(55):C2=PEEK(56)+P        :REM*207
430 POKEC+113,C1:POKEC+114,C2:POKEC+117,C1:
    POKEC+118,C2                      :REM*13
440 PRINT"{CTRL 9}DEFINE COMMANDS":PRINT"JU
    ST HIT RETURN TO END":L=1:A=129:REM*255
450 A$="":PRINT"COMMAND"L;:INPUTA$:IFA$=""T
    HEN500                            :REM*67
```

→

Circle 193 on Reader Service card.

Confused by Mail Order Ads???

Price is not the only concern. You should ask . . .

1. Do you have the advertised product in stock?
2. If the product is defective who handles the warranty?
3. What is the total price delivered to my door?

For the straight answers to these and all your questions, call us!

NEW C-128!!!
Call for pricing,
availability & software.

Send A Stamped, Self-Addressed Business Envelope for A Complete Product Listing!!! C-64 Hardware Still Available, CALL!

C-128 HARDWARE
1700 ..... **128K Expander**
1571 Drive ... **350K DS/DD**
1750 ..... **384K Expander**
1670 Auto Modem . **1200 Baud**
1902 Color Monitor 13" RGB/Composite . **80/40 Column Display**
Teknika MJ22 Same Specs as 1902 .... **$289**
1350 Mouse .... Eases Computer Input

C-128 SOFTWARE
JANE .... Integrated Software for use with 1350
Perfect Calc/Writer/Filer, ... Powerful CP/M Business Software

PRINTERS
STAR SG10
2K Buffer
NLQ Mode
CALL!
We stock a complete selection of ribbons
Powertype Daisywheel 18 CPS with Xetec **$354**
Okidata 182 .... **Call**
Riteman C+ .... **Call**
Xetec Super Graphics NEW, 8K Buffer, NLQ Mode, Downloadable Fonts, A BEST BUY .... **Call**
MW-350 Interface .... **Call**

MONITORS
Comrex 12" Amber ... **$75**
Teknika MJ10 ...... **$189**

MODEMS
Master Modem by Video 7 NEW, 300 Baud, Auto Dial/Answer Up/Download Software, CompuServe Sample, American Made Best Buy **$49**
Commodore 1660 .... **$59**
VIP Terminal .... **Call**
CompuServe Starter Kit & Vidtex ... Both for **39.95**

ACCESSORIES
Com Cool/Plus **$49/69**
Disk Head Cleaner **12**
Power Pak **$27**
Surge Protector 4-Plug ... **25**
• *SPECIAL* • **Xidex Diskettes SS/DD $10.95** • *SPECIAL* •

NAUGAHYDE COVERS by AMERICAN COVER
Commodore C-128 or 1571 Drive .... each **$ 8**
C-64 or 1541 Drive ... ea. **$6**
MSD Drives 1/2 .... **6/7**
Gemini 10X & SG-10 .... **9**
1702 Monitor **11**
1525/MPS 801 .... **8**
1526/MPS 802 .... **9**

DATABASE MANAGERS
The Consultant **$59**
Super Base 64 .... **49**
Vizastar **89**

WORD PROCESSORS
Paper Clip/& speller **$55/69**
Fleet System 2 .... **Call**
Easy Script/Spell ... **$35/17**
Paperback Writer **37**

MOST ORDERS SHIPPED WITHIN 48 HOURS! Advertised prices are for bank check or money order. VISA/MC orders add 3.5%. NO C.O.D ORDERS. Personal or company checks delay orders 21 days. All sales are final — defective merchandise exchanged for same product only. Call for return authorization number. All returned products are subject to a restocking fee unless they are defective and returned for exact exchange. In the continental U.S. add 3% for shipping ($2.50 min.) Please call for shipping on monitors. Ohio residents add 5.5% sales tax. Prices & availability subject to change.

HOURS: MONDAY-FRIDAY 10 AM to 10 PM • SATURDAY 10 AM to 5 PM

ORDER LINE: 800-638-2617
AUTHORIZED COMMODORE REPAIR CENTER
INFORMATION & IN OHIO 216/758-0009

BIG BYTES

1301 BOARDMAN-POLAND ROAD POLAND, OHIO 44514

Listing 1 continued.

```
460 INPUT"LINE NUMBER";N:X$=A$+Z$+"G{SHFT O
    }"+MID$(STR$(N),2)+Z$              :REM*203
470 IFA+LEN(X$)>383THENPRINT"TABLE OVERFLOW
    ":GOTO500                          :REM*117
480 FORI=1TOLEN(X$):POKEC+A,ASC(MID$(X$,I,1
    )):A=A+1:NEXTI                      :REM*91
490 POKEC+A,0:L=L+1:GOTO450            :REM*215
500 IFL=1THEN440                       :REM*111
510 INPUT"OKAY (Y/N)";A$:IFA$="N"THEN440
                                        :REM*65
520 IFA$<>"Y"THEN510                   :REM*120
530 PRINT"{CTRL 9}INSERT DESTINATION DISK"
                                       :REM*142
540 W$="":INPUT"WEDGE NAME";W$:IFW$=""THEN5
    40                                  :REM*50
550 W2$=W$+".W":PRINT"SAVING "W2$:CLOSE5:CL
    OSE15:OPEN15,8,15                  :REM*170
560 FORI=1TOLEN(W2$):POKE575+I,ASC(MID$(W2$
    ,I,1)):NEXTI                       :REM*246
570 POKE183,LEN(W2$):POKE184,5:POKE185,1:PO
    KE186,8                            :REM*150
580 POKE187,64:POKE188,2:POKE780,55:POKE781
    ,T1:POKE782,T2                     :REM*174
590 SYS65496:GOSUB730:IFER<>0THEN540
                                       :REM*164
600 PRINT:PRINTW$" CONTAINS:":X$="LOAD"+CHR
    $(34)+W2$+CHR$(34)+",8,1"+Z$        :REM*14
610 X$=X$+"NEW"+Z$+"P{SHFT O}55,"+STR$(PEEK
    (55))+":P{SHFT O}56,"+STR$(PEEK(56))
                                        :REM*22
620 X$=X$+":P{SHFT O}770,"+STR$(PEEK(55))+"
    :P{SHFT O}771,"+STR$(PEEK(56))+Z$:REM*8
630 FORI=1TOLEN(X$):V=ASC(MID$(X$,I)):POKE8
    74+I,V:PRINTCHR$(V-(V=0)*13);:NEXTI
                                         :REM*2
640 PRINT:PRINT"SAVING "W$             :REM*150
650 CLOSE5:CLOSE15:OPEN15,8,15,"I":OPEN5,8,
    5,"0:"+W$+",P,W"                   :REM*154
660 GOSUB730:IFER<>0THENCLOSE5:CLOSE15:GOTO
    540                                :REM*108
670 PRINT#5,CHR$(2)CHR$(3)CHR$(60)CHR$(3);
                                        :REM*58
680 FORI=772TO1019:PRINT#5,CHR$(PEEK(I));:N
    EXTI                               :REM*224
690 CLOSE5:CLOSE15:PRINT"{CTRL 9}DONE"
                                       :REM*138
700 PRINT"TO INSTALL WEDGE"            :REM*156
710 PRINT"LOAD"CHR$(34)W$CHR$(34)",8,1"
                                        :REM*56
720 END                                :REM*212
730 INPUT#15,ER,E1$,TT,SS:IFER=0THENRETURN
                                        :REM*72
740 PRINTE1$;TT;SS:RETURN               :REM*46
750 REM DATA BLOCK 1                   :REM*198
760 DATA172,106,3,185,107,3,208,13,169,131
                                       :REM*188
770 DATA141,2,3,169,196,141,3,3,108,2
                                        :REM*23
780 DATA3,162,0,185,107,3,157,0,2,240
                                       :REM*145
790 DATA4,232,200,208,244,200,140,106,3,162
                                        :REM*77
800 DATA255,160,1,76,134,196,0,0       :REM*111
810 REM DATA BLOCK 2                    :REM*19
820 DATA173,104,96,240,3,32,76,96,32,96,197
    ,160,0,162,0,189                   :REM*125
830 DATA0,2,217,129,96,208,8,9,0,240,31,232
    ,200,208,240,185                   :REM*199
840 DATA129,96,240,3,200,208,248,200,185,12
    9,96,208,250,200,185,129           :REM*195
850 DATA96,208,218,162,255,160,1,76,134,196
    ,162,255,200,232,185,129           :REM*193
860 DATA96,157,0,2,208,246,32,76,96,24,144,
    231,162,23,189,105                 :REM*157
```

→

```
870 DATA96,168,189,43,0,157,105,96,152,157,
    43,0,202,16,239,173                :REM*111
880 DATA104,96,73,255,141,104,96,96,0,1,98,
    137,98,137,98,137                  :REM*35
890 DATA98,0,128,0,0,0,128,0,0,0,0,0,0,0,0,
    0                                  :REM*165
900 REM DATA BLOCK 3                   :REM*125
910 DATA0,104,5,76,18,129,31,129,40,129,46,
    129                                :REM*117
920 DATA62,129,70,76,78,105,85,105,95,104,1
    00,104                             :REM*221
```

Listing 2. *Sample wedge utilities.*

```
10 REM SAMPLE UTILITY PROGRAMS         :REM*206
20 REM ERR-READ DISK ERROR CHANNEL     :REM*86
30 CLOSE100:OPEN100,8,15               :REM*54
40 INPUT#100,N,ER$,T,S                 :REM*38
50 PRINTN;ER$;T;S:CLOSE100:END         :REM*56
60 REM HEX-CONVERT A NUMBER FROM DECIMAL TO
    HEXADECIMAL                        :REM*36
70 PRINT"CONVERT TO HEX"               :REM*180
80 D=0:INPUT"DECIMAL";D:IFD=0THENEND :REM*2
90 H$="":D=D/4096:FORI=1TO4:T%=D:H$=H$+CHR$
   (48+T%-(T%>9)*7)                    :REM*10
100 D=16*(D-T%):NEXT:PRINT"HEX "H$:GOTO80
                                       :REM*186
110 REM DEC-CONVERT FROM HEXADECIMAL TO DEC
    IMAL                               :REM*64
120 PRINT"CONVERT TO DECIMAL"          :REM*232
130 H$="":INPUT"HEX";H$:IFH$=""THENEND
                                       :REM*146
140 D=0:FORI=1TO4:T%=ASC(H$):T%=T%-48+(T%>6
    4)*7                               :REM*24
150 H$=MID$(H$,2):D=16*D+T%:NEXT:PRINT"DECI
    MAL"D:GOTO130                      :REM*122
160 REM INIT-INITIALIZE DISK DRIVE     :REM*44
170 CLOSE100:OPEN100,8,15,"I":INPUT#100,N,E
    R$,T,S                             :REM*222
180 IFN<>0THEN50                       :REM*60
190 PRINT"DRIVE INITIALIZED":END       :REM*56
200 REM SCRATCH-DELETE A FILE FROM DISK
                                       :REM*214
210 F$="":INPUT"FILE";F$:IFF$=""THENEND
                                       :REM*208
220 PRINT"SCRATCH "F$:INPUT"SURE (Y/N)";R$:
    IFR$<>"Y"THENEND                   :REM*38
230 CLOSE100:OPEN100,8,15,"S0:"+F$:GOTO40
                                       :REM*88
240 REM RENAME-RENAME A FILE           :REM*148
250 F1$="":INPUT"OLD NAME";F1$:IFF1$=""THEN
    END                                :REM*68
260 F2$="":INPUT"NEW NAME";F2$:IFF2$=""THEN
    END                                :REM*137
270 CLOSE100:OPEN100,8,15,"R0:"+F2$+"="+F1$
    :GOTO40                            :REM*45
280 REM HEADER-FORMAT A NEW DISK       :REM*233
290 F1$="":INPUT"DISK NAME";F1$:IFF1$=""ORL
    EN(F1$)>16THEN290                  :REM*123
300 F2$="":INPUT"2 CHAR ID";F2$:IFLEN(F2$)<
    >2THEN300                          :REM*81
310 PRINT"THIS WILL ERASE DISK":INPUT"GO AH
    EAD (Y/N)";R$:IFR$<>"Y"THENEND     :REM*81
320 CLOSE100:OPEN100,8,15,"N0:"+F1$+","+F2$
    :CLOSE100:GOTO20                   :REM*159
330 REM DIR-PRINT DISK DIRECTORY       :REM*5
340 Z$=CHR$(0):CLOSE100:CLOSE101:OPEN100,8,
    15:OPEN101,8,0,"$0"                :REM*13
350 INPUT#100,N,ER$,T,S:IFN<>0THEN50:REM*93
360 GET#101,A$:IFA$<>"{CTRL 9}"THEN360
                                       :REM*193
370 PRINTA$;:GOTO460                   :REM*63
380 GETC$:IFC$=""THEN420               :REM*243
390 IFC$<>" "THEN510                   :REM*203
400 GETC$:IFC$=""THEN400               :REM*135
410 IFC$<>" "THEN510                   :REM*223
420 GET#101,A$:S=ST:A=ASC(A$+Z$)       :REM*131
430 GET#101,B$:S=ST:B=ASC(B$+Z$)       :REM*157
440 IFSTHEN510                          :REM*5
450 IFA=1ANDB=1THENGOSUB480            :REM*209
460 GET#101,A$:IFA$=""THENPRINT:GOTO380
                                       :REM*219
470 PRINTA$;:GOTO460                   :REM*163
480 GET#101,A$:S=ST:A=ASC(A$+Z$)       :REM*191
490 GET#101,B$:S=ST:B=ASC(B$+Z$)       :REM*217
500 N=B*256+A:PRINTN;:RETURN           :REM*231
510 CLOSE101:CLOSE100                  :REM*101
520 END                                 :REM*12
530 REM HELP-PRINT DOCUMENTATION       :REM*120
540 PRINT:PRINT"COMMANDS AVAILABLE ARE:"
                                       :REM*210
550 PRINT"ERR{5 SPACEs}-READ ERROR CHANNEL"
                                       :REM*176
560 PRINT"HEX{5 SPACEs}-CONVERT NUMBER TO H
    EX"                                :REM*154
570 PRINT"DEC{5 SPACEs}-CONVERT NUMBER TO D
    ECIMAL"                             :REM*32
580 PRINT"INIT{4 SPACEs}-INITIALIZE DISK DR
    IVE"                               :REM*230
590 PRINT"SCRATCH -DELETE DISK FILE":REM*36
600 PRINT"RENAME{2 SPACEs}-RENAME A DISK FI
    LE"                                :REM*164
610 PRINT"HEADER{2 SPACEs}-FORMAT A NEW DIS
    K"                                  :REM*12
620 PRINT"DIR{5 SPACEs}-PRINT THE DISK DIRE
    CTORY"                             :REM*182
630 PRINT"HELP{4 SPACEs}-PRINT THIS HELP ME
    SSAGE"                             :REM*102
640 END                                :REM*132
```

Circle 251 on Reader Service card.

NEW VERSION 2.0

THE MIRROR

DISK COPIER

$24.95

NO FINER OR MORE ADVANCED ARCHIVAL COPIER AVAILABLE AT ANY PRICE.
EASY TO USE. DOES NOT CAUSE DRIVE HEAD TO KNOCK.
COPIES UP TO 41 TRACKS
PERIODIC UPDATE POLICY.
AUTOMATICALLY MAKES BACK-UP COPIES FROM VIRTUALLY ALL PROTECTED SOFTWARE.
NIBBLES, HALF TRACKS, COPIES EXTRA SECTORS AND EXTRA TRACKS.
REPRODUCES ALL DISK ERRORS AUTOMATICALLY.
FAST, COPIES FULL DISK IN AS LITTLE AS 4-7 MINS. EVEN COPIES ITSELF.

WE COPY MORE!
MASTERCARD, VISA, M.O. OR CHECK OK
+ $3 SHIPPING & HANDLING
C.O.D. OR FOREIGN ORDERS ADD $2
CALIF. ORDERS ADD 6% SALES TAX
— WRITE OR CALL —

Compumed

(408) 758-2436
P.O. BOX 6427
SALINAS, CA 93912
FOR COMMODORE 64 AND 1541 DRIVE

VISA MasterCard

Block Busters

With a paddle and a ball, the object of this game is to "bust" as many blocks as possible without letting the ball slip past you.

By MICHAEL LONGTIN

Block Busters is a one-player game that uses color, sound and the fast action of machine language. The secret is to keep your eye on the ball—not on how many blocks it breaks.

There are 255 skill levels from which to choose. Level 255 is extraordinarily slow, and level 1 is impossibly fast. The best level for a beginner is probably 35.

The game begins with 95 blocks at the top of the screen. You have five balls. Move the paddle left and right with the joystick, which you must plug into port 2. Try to keep the paddle under the ball as much as possible.

When you clear the screen, you move to the next fastest level and a full new screen. When you lose five balls, your final score is displayed—you receive one point for each block you bust—and you are asked if you want to play again.

A Pause Feature

Have you ever wanted a pause feature in your program, to prevent you from having to keep checking for input? Well, here's your answer, a short machine language subroutine that checks the keyboard. If the shift-lock key is pressed in the down position, program execution halts until the shift-lock key is in the up position. You need only type in the following short program and run it. This program Pokes the machine language Pause routine into memory.

```
10 INPUT "STARTING
   ADDRESS";A:IN = A + 13
20 FOR I = 0 TO 25:READ N:POKE
   I + A,N:NEXT I
30 POKE A + 7,IN/256:POKE
   A + 2,IN - INT(IN/256)*256
40 PRINT "TO ACTIVATE, TYPE
   'SYS";A;" ' "
50 DATA 120,169,0,141,20,3,
   169,0,141,21,3,88,96
60 DATA 32,159,255,173,141,2,201,
   1,240,246,76,49,234
```

This routine is completely relocatable, which means it can be put anywhere in memory. When the program asks for the starting address, enter the address of the memory location where you want the Pause routine to be stored. A good place for it is in the machine language buffer at 49152.

When the program ends, it tells you how to activate the Pause routine. Put these instructions at the beginning of your program. Do not activate it when you're in Edit mode; it won't work then, because when you press the shift key (to move the cursor or clear the screen), the cursor stops. To deactivate the Pause routine, type SYS 8 or press the run/stop and restore keys.

For those interested, here is a listing of the machine code Pause routine in assembler syntax:

```
1000 START SEI ;DISABLE ALL
     INTERRUPTS
1010 LDA #<PROG ;CHANGE
1020 STA 788 ;INTERRUPT
1030 LDA #>PROG ;VECTOR
1040 STA 789
1050 CLI ;ENABLE ALL INTERRUPTS
1060 RTS ;RETURN TO BASIC
1070 PROG JSR SCNKEY ;SCAN
     KEYBOARD
1080 LDA $028D ;SHIFT FLAG
1090 CMP #$01 ;SHIFT PRESSED?
1100 BEQ PROG;NO - CHECK AGAIN
1110 JMP $EA31 ;YES - JUMP TO
     NORMAL INTERRUPT ROUTINE
```

RUN It Right

C-64; C-128 (in C-64 mode); joystick

As you can see, this routine is interrupt-driven. It is executed every 1/60th of a second along with the regular Interrupt routine, which updates the software clock, handles the cursor flash, reads the keyboard and keeps the cassette motor on if the play button is pressed.

The first part of the program changes the location of the interrupt routine to point to PROG. PROG scans the keyboard (which updates the shift flag) and checks the shift flag (which will contain a 1 if the shift key is pressed). If the shift key is pressed, the program rechecks. If it is not pressed, then it transfers control to the normal Interrupt routine (at $EA31).

Special Typing Instructions

There are two programs with this article. Listing 1, Blockbuster Loader, Pokes the machine code at 49152 (the machine code buffer). Please note that you can't put your pause program at 49152, but you can put it higher in the machine code buffer, at, say, 51200. After you have typed in the Loader program, run it; then type in the main Blockbuster program and run it. I suggest you save these programs after you've typed them in.

For those of you who don't want to type in the program yourselves, I'll be glad to make you a copy of the program (disk only). Just send me $3, a blank disk and a self-addressed stamped envelope.

Address all author correspondence to Michael Longtin, RFD 2, Box 2760, Greene, ME 04236.

Listing 1. *Blockbuster Loader program.*

```
5 PRINT"{SHFT CLR}PLEASE WAIT WHILE I POKE
  IN MY DATA..."                   :REM*165
10 I=49152                          :REM*74
20 READ A:IF A=256 THEN END        :REM*182
30 POKE I,A:I=I+1:GOTO 20          :REM*212
49152 DATA 169,160,162,0,157,192,7,232
                                   :REM*232
49160 DATA 224,40,208,248,96,169,4,141
                                    :REM*42
49168 DATA 6,192,169,0,141,5,192,32 :REM*22
49176 DATA 0,192,169,7,141,6,192,169
                                   :REM*172
49184 DATA 192,141,5,192,32,0,192,76
                                   :REM*124
49192 DATA 67,192,32,176,195,169,65,141
                                    :REM*38
49200 DATA 4,212,162,16,160,0,136,208
                                    :REM*30
49208 DATA 253,202,208,248,169,64,141,4
                                   :REM*172
49216 DATA 212,96,234,160,0,169,160,153
                                   :REM*242
49224 DATA 0,4,153,39,4,153,240,4  :REM*114
49232 DATA 153,23,5,153,224,5,153,7:REM*214
49240 DATA 6,153,208,6,153,247,6,24:REM*118
49248 DATA 152,105,40,168,192,240,208,221
                                   :REM*246
49256 DATA 169,102,160,0,162,0,157,41
                                   :REM*186
49264 DATA 4,157,81,4,157,121,4,157 :REM*64
49272 DATA 161,4,157,201,4,232,224,38
                                    :REM*38
49280 DATA 208,236,169,170,133,251,169,7
                                   :REM*180
49288 DATA 133,252,96,32,229,192,32,239
                                   :REM*138
49296 DATA 192,173,0,220,234,201,123,240
                                   :REM*170
49304 DATA 10,201,119,240,21,32,229,192
                                   :REM*254
49312 DATA 96,208,250,198,251,160,0,177
                                   :REM*176
49320 DATA 251,201,32,240,16,230,251,76
                                   :REM*226
49328 DATA 157,192,160,7,177,251,201,32
                                   :REM*112
49336 DATA 240,25,76,157,192,230,251,160
                                   :REM*226
49344 DATA 6,169,32,145,251,165,251,208
                                     :REM*6
49352 DATA 2,198,252,198,251,32,229,192
                                    :REM*30
49360 DATA 76,157,192,160,0,169,32,145
                                   :REM*252
49368 DATA 251,230,251,208,2,230,252,32
                                   :REM*198
49376 DATA 229,192,76,157,192,160,5,169
                                    :REM*30
49384 DATA 120,145,251,136,208,251,96,162
                                   :REM*182
49392 DATA 70,160,0,136,208,253,202,208
                                   :REM*166
49400 DATA 248,96,234,234,96,169,1,141
                                   :REM*146
49408 DATA 0,196,141,1,196,169,16,141
                                    :REM*47
49416 DATA 2,196,141,3,196,173,2,196
                                   :REM*115
49424 DATA 141,4,196,173,3,196,141,5:REM*39
49432 DATA 196,173,0,196,201,1,240,3:REM*87
49440 DATA 76,47,193,173,2,196,56,233
                                   :REM*135
49448 DATA 1,141,2,196,76,56,193,173
                                   :REM*195
49456 DATA 2,196,24,105,1,141,2,196:REM*203
49464 DATA 173,1,196,201,1,240,3,76 :REM*17
49472 DATA 78,193,173,3,196,24,105,1:REM*97
49480 DATA 141,3,196,76,87,193,173,3
                                   :REM*135
49488 DATA 196,56,233,1,141,3,196,169
                                   :REM*175
49496 DATA 4,141,255,195,169,0,141,254
                                   :REM*131
49504 DATA 195,141,12,196,173,2,196,141
                                    :REM*37
49512 DATA 13,196,160,5,173,13,196,10
                                    :REM*37
49520 DATA 141,13,196,173,12,196,42,141
                                   :REM*155
49528 DATA 12,196,136,192,0,208,237,24
                                   :REM*155
49536 DATA 173,254,195,109,13,196,141,254
                                   :REM*245
49544 DATA 195,173,255,195,109,12,196,141
                                   :REM*133
49552 DATA 255,195,173,2,196,141,13,196
                                   :REM*165
49560 DATA 169,0,141,12,196,160,3,173
                                    :REM*43
49568 DATA 13,196,10,141,13,196,173,12
                                   :REM*193
49576 DATA 196,42,141,12,196,136,208,239
                                   :REM*231
49584 DATA 24,173,254,195,109,13,196,141
                                   :REM*249
49592 DATA 254,195,173,255,195,109,12,196
                                   :REM*209
49600 DATA 141,255,195,169,4,141,11,196
                                   :REM*103
49608 DATA 169,0,141,10,196,141,12,196
                                   :REM*199
```

Listing 1 continued.

```
49616 DATA 173,4,196,141,13,196,160,5
                                  :REM*139
49624 DATA 173,13,196,10,141,13,196,173
                                  :REM*109
49632 DATA 12,196,42,141,12,196,136,192
                                  :REM*123
49640 DATA 0,208,237,24,173,10,196,109
                                   :REM*67
49648 DATA 13,196,141,10,196,173,11,196
                                  :REM*207
49656 DATA 109,12,196,141,11,196,173,4
                                  :REM*255
49664 DATA 196,141,13,196,169,0,141,12
                                   :REM*36
49672 DATA 196,160,3,173,13,196,10,141
                                   :REM*98
49680 DATA 13,196,173,12,196,42,141,12
                                   :REM*96
49688 DATA 196,136,208,239,173,10,196,109
                                  :REM*128
49696 DATA 13,196,141,10,196,173,11,196
                                    :REM*0
49704 DATA 109,12,196,141,11,196,24,173
                                  :REM*108
49712 DATA 3,196,109,254,195,141,254,195
                                  :REM*244
49720 DATA 169,0,109,255,195,141,255,195
                                  :REM*210
49728 DATA 24,173,5,196,109,10,196,141
                                  :REM*214
49736 DATA 10,196,169,0,109,11,196,141
                                   :REM*84
49744 DATA 11,196,173,255,195,141,98,194
                                  :REM*244
49752 DATA 173,254,195,141,97,194,169,81
                                   :REM*28
49760 DATA 141,244,6,173,10,196,141,114
                                   :REM*48
49768 DATA 194,173,11,196,141,115,194,169
                                  :REM*212
49776 DATA 32,141,205,6,173,2,196,201
                                  :REM*136
49784 DATA 23,240,3,76,129,194,76,254
                                  :REM*178
49792 DATA 194,173,2,196,201,22,240,3
                                   :REM*62
49800 DATA 76,183,194,24,173,254,195,105
                                   :REM*12
49808 DATA 40,141,14,196,169,0,109,255
                                  :REM*174
49816 DATA 195,141,15,196,173,14,196,141
                                   :REM*64
49824 DATA 169,194,173,15,196,141,170,194
                                  :REM*158
49832 DATA 173,162,7,201,32,240,79,169
                                   :REM*40
49840 DATA 1,141,0,196,32,42,192,173
                                  :REM*158
49848 DATA 2,196,201,1,240,3,76,201:REM*212
49856 DATA 194,169,0,141,0,196,32,42
                                  :REM*242
49864 DATA 192,173,3,196,201,38,240,3
                                  :REM*240
49872 DATA 76,219,194,169,0,141,1,196
                                  :REM*230
49880 DATA 32,42,192,173,3,196,201,1
                                  :REM*128
49888 DATA 240,3,76,237,194,169,1,141
                                  :REM*140
49896 DATA 1,196,32,42,192,169,32,141
                                  :REM*140
49904 DATA 152,7,141,191,7,32,139,192
                                  :REM*250
49912 DATA 76,255,194,76,13,193,96,173
                                  :REM*246
49920 DATA 0,196,201,1,240,5,76,25  :REM*99
49928 DATA 196,208,253,76,55,196,173,1
                                  :REM*113
49936 DATA 196,201,0,240,8,169,39,141
                                  :REM*241
49944 DATA 55,195,76,37,195,169,41,141
                                  :REM*207
49952 DATA 55,195,76,37,195,173,254,195
                                  :REM*147
49960 DATA 141,13,196,173,255,195,141,12
                                   :REM*49
49968 DATA 196,234,24,173,13,196,105,39
                                   :REM*69
49976 DATA 141,13,196,173,12,196,105,0
                                  :REM*129
49984 DATA 141,12,196,173,13,196,141,80
                                  :REM*141
49992 DATA 195,173,12,196,141,81,195,173
                                  :REM*139
50000 DATA 244,6,201,102,240,3,76,13:REM*43
50008 DATA 193,76,102,195,201,0,240,3
                                   :REM*63
50016 DATA 76,102,195,76,13,193,238,22
                                   :REM*51
50024 DATA 196,173,2,196,141,4,196,173
                                  :REM*129
50032 DATA 3,196,141,5,196,32,42,192
                                  :REM*231
50040 DATA 173,1,196,201,0,240,6,160:REM*73
50048 DATA 1,76,135,195,234,160,255,140
                                  :REM*211
50056 DATA 23,196,76,141,195,24,173,3
                                  :REM*129
50064 DATA 196,109,23,196,141,3,196,32
                                   :REM*55
50072 DATA 87,196,76,165,195,141,2,196
                                    :REM*7
50080 DATA 169,0,141,0,196,173,22,196
                                   :REM*91
50088 DATA 201,95,240,3,76,87,193,96:REM*91
50096 DATA 166,2,165,253,133,253,165,254
                                  :REM*191
50104 DATA 133,254,224,0,240,16,169,25
                                  :REM*157
50112 DATA 24,101,253,133,253,169,0,101
                                   :REM*39
50120 DATA 254,133,254,202,208,240,160,0
                                  :REM*233
50128 DATA 177,253,153,0,212,200,192,26
                                   :REM*11
50136 DATA 208,246,96,97,8,192,7,64 :REM*27
50144 DATA 18,48,0,0,0,0,0,0       :REM*215
50152 DATA 0,0,0,0,0,0,0,0          :REM*93
50160 DATA 0,0,0,15,0,0,0,0        :REM*231
50168 DATA 0,251,255,197,64,0,244,6:REM*119
50176 DATA 0,0,18,36,17,37,255,255  :REM*62
50184 DATA 255,255,205,6,0,136,162,7
                                  :REM*168
50192 DATA 255,255,255,255,255,255,17,1
                                  :REM*184
50200 DATA 255,173,1,196,201,0,240,5
                                  :REM*250
50208 DATA 169,41,76,68,196,169,39,76
                                  :REM*130
50216 DATA 68,196,169,24,141,50,195,169
                                  :REM*214
50224 DATA 105,141,54,195,76,37,195,169
                                  :REM*166
50232 DATA 56,141,50,195,169,233,141,54
                                  :REM*176
50240 DATA 195,76,79,196,141,55,195,169
                                  :REM*186
50248 DATA 105,141,62,195,76,42,196,169
                                  :REM*136
50256 DATA 233,141,62,195,76,14,195,173
                                   :REM*68
```

→

Listing 1 continued.

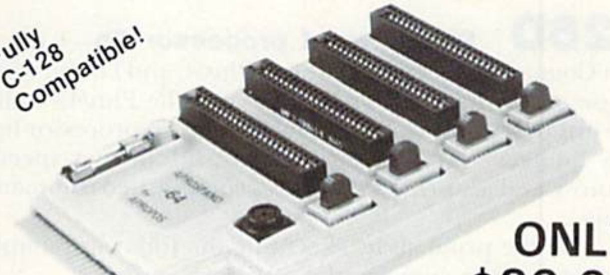
```
50264 DATA 0,196,201,0,240,8,169,255
                                   :REM*236
50272 DATA 141,24,196,76,107,196,169,1
                                   :REM*172
50280 DATA 141,24,196,24,173,2,196,109
                                   :REM*186
50288 DATA 24,196,141,2,196,173,0,196
                                   :REM*234
50296 DATA 201,0,240,8,169,0,141,0 :REM*110
50304 DATA 196,76,137,196,169,1,141,0
                                   :REM*240
50312 DATA 196,96,256              :REM*74
```

Listing 2. *Blockbuster main program.*

```
1 B=5:S=0                          :REM*155
5 POKE253,219:POKE254,195:POKE2,0:SYS50096
                                   :REM*193
10 PRINT"{SHFT CLR}{14 CRSR RTs}BLOCK BUST"
                                   :REM*86
20 PRINT"{3 CRSR DNs}{10 CRSR RTs}INSTRUCTI
   ONS? (Y/N)"                     :REM*204
30 GETA$:IFA$=""THEN30             :REM*202
40 IFA$<>"Y"ANDA$<>"N"THEN30       :REM*0
50 IFA$="N"THEN131                 :REM*150
60 PRINT"{SHFT CLR}{2 CRSR DNs}THE OBJECT O
   F BLOCK BUST IS TO BUST AS"     :REM*76
70 PRINT"{CRSR DN}MANY BLOCKS AS POSSIBLE.
   YOU HAVE TO"                    :REM*212
80 PRINT"{CRSR DN}KEEP THE BALL IN MOTION B
   Y MOVING YOUR"                  :REM*34
90 PRINT"{CRSR DN}PADDLE UNDERNEATH IT SO I
   T CAN BOUNCE"                   :REM*196
100 PRINT"{CRSR DN}OFF. YOU HAVE 5 BALLS PE
    R GAME."                       :REM*118
105 PRINT"{CRSR DN}USE JOYSTICK PORT 2."
                                   :REM*15
110 PRINT"{2 CRSR DNs}{14 CRSR RTs}{CTRL 9}
    GOOD LUCK!"                    :REM*130
120 PRINT"{CRSR DN}{10 CRSR RTs}PRESS {CTRL
     9}SPACE{CTRL 0} TO PLAY"      :REM*214
130 POKE198,0:WAIT197,32           :REM*248
131 INPUT"{SHFT CLR}{13 CRSR DNs}{8 CRSR RT
    s}SPEED (1-255),1=FASTEST";L   :REM*145
132 POKE49392,L:POKE50198,0        :REM*224
140 POKE53280,13:POKE53281,0:PRINT"{SHFT CL
    R}":POKE53281,1:SYS49165       :REM*142
141 PRINT"{HOME}{CRSR DN}{CRSR RT}{COMD 7}{
    COMD +} {COMD +} {COMD +} {COMD +} {COM
    D +} {COMD +} {COMD +} {COMD +} {COMD +
    } {COMD +} {COMD +} {COMD +} {COMD +} {
    COMD +} {COMD +} {COMD +} {COMD +} {COM
    D +} {COMD +} "                 :REM*15
142 PRINT"{CRSR RT} {COMD +} {COMD +} {COMD
     +} {COMD +} {COMD +} {COMD +} {COMD +}
     {COMD +} {COMD +} {COMD +} {COMD +} {C
    OMD +} {COMD +} {COMD +} {COMD +} {COMD
     +} {COMD +} {COMD +} {COMD +}":REM*208
143 PRINT"{CRSR RT}{COMD +} {COMD +} {COMD
    +} {COMD +} {COMD +} {COMD +} {COMD +}
    {COMD +} {COMD +} {COMD +} {COMD +} {CO
    MD +} {COMD +} {COMD +} {COMD +} {COMD
    +} {COMD +} {COMD +} {COMD +} " :REM*97
144 PRINT"{CRSR RT} {COMD +} {COMD +} {COMD
     +} {COMD +} {COMD +} {COMD +} {COMD +}
     {COMD +} {COMD +} {COMD +} {COMD +} {C
    OMD +} {COMD +} {COMD +} {COMD +} {COMD
     +} {COMD +} {COMD +} {COMD +}":REM*210
145 PRINT"{CRSR RT}{COMD +} {COMD +} {COMD
    +} {COMD +} {COMD +} {COMD +} {COMD +}
    {COMD +} {COMD +} {COMD +} {COMD +} {CO
    MD +} {COMD +} {COMD +} {COMD +} {COMD
    +} {COMD +} {COMD +} {COMD +} " :REM*99
146 POKE50179,22:POKE50178,12      :REM*34
147 POKE50176,1:POKE50177,1        :REM*119
148 FORA=56216TO56254:POKEA,10:NEXT:REM*198
150 SYS49421                       :REM*240
151 IFPEEK(50198)=95THEN1000       :REM*151
160 POKE1024+PEEK(50178)*40+PEEK(50179),32
                                   :REM*126
164 B=B-1:IFB=0THEN190             :REM*170
165 PRINT"{CTRL 1}{HOME}{8 CRSR DNs}{7 CRSR
     RTs}PRESS {CTRL 9}SPACE{CTRL 0} FOR NE
    XT BALL"                       :REM*223
166 POKE198,0                      :REM*78
167 GETA$:IFA$<>" "THEN167         :REM*19
168 PRINT"{CRSR UP}{CRSR RT}{33 SPACES}"
                                   :REM*248
180 GOTO146                        :REM*110
190 POKE1024+PEEK(50178)*40+PEEK(50179),32
                                   :REM*156
200 S=S+PEEK(50198)                :REM*202
205 PRINT"{SHFT CLR}{11 CRSR DNs}{14 CRSR R
    Ts}SCORE:"S                    :REM*117
210 PRINT"{CRSR DN}{10 CRSR RTs}PLAY AGAIN?
     (Y/N)"                        :REM*234
220 GETA$:IFA$=""THEN220           :REM*0
230 IFA$<>"Y"ANDA$<>"N"THEN220     :REM*220
240 IFA$="N"THENPRINT"{SHFT CLR}":END
                                   :REM*166
250 RUN                            :REM*36
1000 PRINT"{SHFT CLR}{7 CRSR DNs}{12 CRSR R
     Ts}YOU WON AT SPEED"L         :REM*11
1005 S=S+PEEK(50198)               :REM*242
1010 PRINT"{2 CRSR DNs}{CRSR RT}PRESS {CTRL
      9}SPACE{CTRL 0} FOR NEXT SPEED: SPEED
     "L-1                          :REM*151
1020 POKE198,0:WAIT197,32:L=L-1:GOTO132
                                   :REM*5
```

APROSPAND-64™ Gives your Commodore 64 full expandability! This superbly designed expansion module plugs into the 64 & gives you 4 switchable (singly or in any combination) expansion connectors - plus fuse protection - plus a reset button!

Fully C-128 Compatible!



ONLY $39.95

Commodore Interface and Accessories

ParallAX-CD Parallel Printer Interface for use with all Commodore incl. SX-64 (except PET)...$57.95

DSI PPI with Graphics...$44.95

Cardprint G-WIZ Printer Interface...$54.95

AP-Switch -3P 3 to 1 Centronics Parallel Peripheral Switch. Switches active pins 1-18 and 31-36. Connects your computer to up to 3 parallel printers or up to 3 computers to one printer...$79.95

Add Shipping Per Item: $3.00 Cont. U.S. $6.00 CAN, Mexico, HI, AK, UPS Blue

APROPOS TECHNOLOGY
1071-A Avenida Acaso, Camarillo, CA 93010
CALL OUR TOLL FREE ORDER LINES TODAY:
1-(800) 962-5800 USA or 1-(800) 962-3800 CALIFORNIA
TECHNICAL INFORMATION: 1-(805) 987-2454
All Products have 2 Week Satisfaction or Money Back Guarantee

CA Res. Add 6% Tax
Listed are cash prices.
Visa or MC add 3%

From p. 11.

```
40 V$="{SHFT CLR}{6 CRSR DNs}":W$=CHR$(141
   +CHR$(27)+"T"+CHR$(19):X$="RESET"
90 PRINT"THEN TYPE X <RETURN>":PRINT

2 REM VIC-20 CHANGES
40 POKE937,PEEK(244)-1:POKE942,191
50 PRINT"{SHFT CLR}{12 CRSR DNs}"
60 PRINT"POKE923,N SHOWS PAGE N"
70 PRINT"STOP/RESTORE KILLS"
80 PRINT"{CRSR DN}SYS900 REACTIVATES"
90 SYS900:END
```

Louis F. Sander
Pittsburgh, PA

$26C **New life for the VIC**—Here's a good way to use some of your VIC cartridges on your C-64, in a manner of speaking. The VIC-20 Programmer's Aid cartridge has some excellent utilities on it, the Renumber utility being one of the most useful. After writing a Basic program on the C-64, save it to disk or tape as you usually do. Now load the program into the VIC. (You may need extra memory if the program is a long one.) Next, activate the Programmer's Aid cartridge. You can use all its features, as long as you don't run the C-64 program on the VIC. When your editing is finished, resave the program and move it back to your C-64.

Try this trick with VICMON, too.

Murray Stockill
Seattle, WA

$26D **Plus/4 word processor tip**—I use a non-Commodore printer with my Plus/4, and I often want to use one of its special typefaces with the Plus/4's built-in word processor. Unfortunately, the word processor has only limited built-in means of accessing printer special features, and my printer requires a complicated command string.

I solve the problem by executing the following simple program before entering the word processor.

```
10 OPEN 4,4 : CMD4
20 PRINT (Printer's code for accessing special typeface)
30 PRINT#4 : CLOSE4
```

The printer does not reset when the computer enters the word processor, so when I print out my document, it comes out in the typeface I selected above.

Chris Edgeworth
Jasper, TX

$26E **Making connections**—There are many sockets on the rear panel of any Commodore computer, and if you move your machine very often, you must continually match the cables with the proper sockets, while everything is out of sight behind the machine. The video and serial bus DIN connectors are very similar in appearance, which makes it difficult to distinguish between them.

I've used tape and a felt-tip marker to put connector identification labels on the top surface of my machine, just above the back panel. Now I can see where the cables belong, by just looking at the labels. With that information at hand, I can connect my cables by feel, without looking at the back panel, and with no fear of making a shocking mistake.

Kay Belle Joyner
Fitz, IN

$26F **Disaster prevention**—If you're charged with static electricity and touch one of the joystick ports, you can destroy an important chip inside. Since your video screen is powerfully charged with static, there's a disaster just waiting to happen.

If you put a piece of black electrical tape over the joystick ports, you will insulate them against all but the strongest static charges. The tape is undetectable, won't gum up the ports and can easily be removed when you need to plug in a joystick. It's an excellent safeguard for your computer and your wallet, and I had to learn it the hard way.

Kenny Sumrall
Sumrall, MS

$270 **Screen layout aid**—When I design a hi-res screen, I take an overhead projector transparency pen and draw on my video monitor a picture of how I want the screen to look. Then I take my graphics program and plot dots underneath my pen lines. If I make a mistake or want to change something, I simply take a wet tissue and wipe off the lines on the screen. If you adopt this method of layout, be sure you use transparency pens, not permanent markers. A popular transparency pen is made by Vis-a-Vis and can be found in most bookstores.

Scott Eldridge
Lima, OH

$271 **Diskette handling tip**—Everyone knows it's a bad idea to touch the surface of a floppy disk or to allow it to become contaminated in any way. But not everyone realizes that the *bottom* of the disk is the side that's actually written on.

So, if you spill coffee on a disk, you might not have any problems. But if you lay it on a wet or dirty desktop, you may be asking for trouble.

L.F.S.

$272 **Disk holder**—Office supply stores sell an inexpensive item that is perfect for temporary working storage of computer disks and cartridges. Designed for sorting envelopes or holding telephone messages, it has a plastic base with eight vertical separators, dividing it into seven open-ended compartments. The one I use is

Circle 153 on Reader Service card.

NEW!

Take The Heat Off Your 64 Disk Drive!

Overheating and line surges are a major cause of frustrating program malfunctions and permanent damage to your Commodore 64 disk drive.

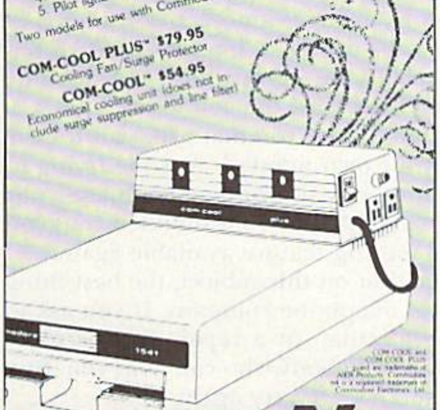
Now, for the first time, you can protect your investment with the COM-COOL PLUS™ Cooling Fan/Surge Protector.

1. Washable filters remove dust **before** forcing air through.
2. Quiet fan can cool two stacked disk drives.
3. Foam base holds unit firmly in place.
4. Protected outlets clip spikes at a safe 130V. Replaceable fuse.
5. Pilot lights monitor power, ground and SURGE protection.

Two models for use with Commodore 64 and VIC disk drives.

COM-COOL PLUS™ $79.95
Cooling Fan/Surge Protector

COM-COOL™ $54.95
Economical cooling unit (does not include surge suppression and line filter)



COM COOL and COM COOL PLUS [illegible] are trademarks of AIER Products. Commodore 64 is a registered trademark of Commodore Electronics Ltd.

AIER

NO CHARGE for shipping UPS ground when you call this #:

414-277-9120

AIER PRODUCTS
522 West Bergen
Milwaukee, WI 53217

CS *Distributed exclusively by:*
COMPUTER SOFTWARE SERVICE • A CHAS. LEVY CIRCULATING COMPANY
SS 495-A Busse Road, Elk Grove Village, IL 60007-2114 • In IL call: 800-331-SOFT
DEALERS ONLY CALL: **1-800-422-4912**

Circle 198 on Reader Service card.

DUST COVERS

- ★ CUSTOM MADE TO FIT
- ★ Heavy 32-oz. VINYL ANTI-STATIC
- ★ EXTENDS EQUIPMENT LIFE
- ★ Choice of Colors Lt. Tan or Brown

COMPUTERS	
C-64; VIC-20; C-16; PLUS 4	7.00
C-128; B-128	13.00
DATASETTE (NEW, C2N)	5.00
DISK DRIVES	
C-1541; C-1571 INDUS GT	8.00
MSD S/D; APPLE S/D	8.00
MSD D/D; APPLE D/D UNIT	10.00
PRINTERS	
C-1525/MPS801	10.00
C1526/MPS802	13.00
C/MPS 803; C-1520; C-1530	8.00
PANASONIC KX-P1090/91	13.00
EPSON MX/RX/FX 80	13.00
GEMINI 10 & STAR 10's	13.00
GEMINI 15 & STAR 15's	16.00
OKIDATA 91/92	13.00
JUKI 6100	16.00
OKIMATE 10	8.00
MONITORS	
C-1702/1703; C-1902 RGBI	16.00
ZENITH ZVM 122/123	16.00
ZENITH ZVM 131/133	23.00
TAXAN RGB 2110	16.00
AMDEK COLOR I	19.00
BMC COLOR	16.00
VIDEO RECORDERS (Dimensions Required)	13.00

Order by stating NAME and MODEL and COLOR CHOICE TAN or BROWN.
Enclose check or money order plus $1.50 per item (4.50 max.) shipping and handling California Res. Include 6.5% Sales Tax.

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONED SKETCH. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES

Crown Custom Covers
9606 SHELLYFIELD ROAD—Dept. B
DOWNEY, CA 90240
(213) 862-8391

Circle 73 on Reader Service card.

UNISOURCE

Your one source for computer hardware, software and peripheral needs since 1981.

What is Unisource? • A leading mail order computer company with a friendly, knowledgeable staff • Accepts VISA & MasterCard at never any additional cost • Provides toll free order lines • Ships in-stock merchandise usually within 48 hours • Discount prices on all products

$239.95 (with purchase of TurboPrint Interface right)

star SG 10

This price-leading dot matrix printer has a NLQ mode that really is near letter quality! The new SG 10 from Star Micronics is a speedy 120 cps in draft mode and is almost daisy-wheel quality in LQ mode. This printer has easy access format switches, friction and tractor feed for personalized stationery and fan-fold paper, downloadable characters for great graphics, and ultra high resolution bit image graphics for precision plotting and graphics. Order with the fully compatible printer interface below for even greater savings.

The SG 10 has a suggested retail of $299.95. Our everyday low Unisource price is $249.95. But order the printer interface with your SG 10 and receive extra savings on both the printer and the interface! The SG 10 is only $239.95 when you purchase either of the Turbo Print interfaces. Order part number **SG 10.**

VOLKSMODEM XII

Open up the world of telecommunications with this powerful 300-1200 baud smart modem specifically designed for your Commodore computer. This is a complete modem-cable-software package. Suggested retail on the package is $339.95 — Unisource low priced at $219.95! The unit is capable of full unattended operation in conjunction with stand alone terminals and computers which have an RS 232 interface. Volksmodem XII features full Bell compatibility, serial command operation, full and half duplex, auto answer, auto dial, tone and pulse dialing, busy detection and more — all of the features found on modems costing hundreds more! **ANC 107C** **$219.95**

$219.95

We'd like to send you a copy of our exciting new catalog covering a full range of Commodore 64 products. It's free just for the asking. Simply fill out this coupon, clip, and send it to the address indicated. We'll put you on our mailing lists and send our complimentary catalog.

Name ____________________

Mailing Address ____________________

City, State, Zip ____________________

"INCREDIBLE!"

BLUE CHIP DISK DRIVE

ONLY $178.95

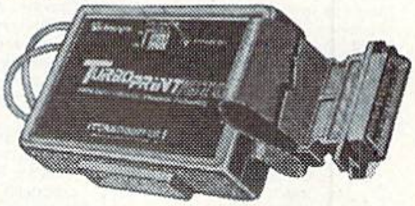
State-of-the-art technology enables this Blue Chip BCD/5.25 disk drive to be more compact, require less power and generate less heat than its Commodore counterpart. This disk drive is fully compatible with all Commodore computers, reads and writes much faster than the Commodore disk drive and operates with thousands of Commodore programs.
BCE 100 . . . . **$178.95**

TURBOPRINT INTERFACE

$59.95 (with purchase of SG 10 Printer left)

The TurboPrint GC was specifically designed for use with Commodore computers. This performance interface prints enhanced Commodore graphics (on printers like the SG 10 above) and has a special line buffer that doubles text printing speed on printers without on-board memory. External dip switches allow you to select specific printer type and device number. Suggested retail on TurboPrint GC is $69.95 and is Unisource priced at $64.95. But with the purchase of the SG 10 printer above, you get the TurboPrint GC for only $59.95. Order part number **TEL 100.**

SPECIAL OFFER!! Get the TurboPrint GTC with optional 16K or 32K printer buffer for $69.95 with the purchase of the SG 10 printer. That's a $79.95 retail value! Order part number **TEL 101.**



SUPER STIK

$9.95

Quality joystick for the budget-minded Commodore user. The Super Stick control cable has built-in isolation electronics for use with the Commodore C64. This will offer the most from software as well as enhance motor skills. No adapter needed. Stick action for maximum enjoyment!
UNI 233S **$9.95**

UNISOURCE ELECTRONICS, INC.
7006 UNIVERSITY • P.O. BOX 64240
LUBBOCK, TX 79464
CALL TOLL FREE 1-800-858-4580
IN TEXAS CALL 1-806-745-8834

MasterCard VISA

a Mighty Sorter, made by W.T. Rogers Company, and it fits very nicely on top of my disk drive.

Using this sorter, I can keep about ten disks and cartridges organized on top of my desk, with no immediate need to return them to their envelopes or storage boxes. It really comes in handy when I'm copying disks or otherwise swapping them in and out of the drive.

Margot Poloka
Sewickley, PA

$273 Space saver—Unless you have a custom computer desk, it's always a problem finding room for your printer paper. I keep my paper in a cardboard tray made from the top of the carton it came in, but there's not much room for it between my printer and the wall. Also, no matter where I put my paper, it tends to tear on the cables at the rear of the printer.

My solution is to prop the tray against the wall at a 45–75 degree angle. This lets me move the printer closer to the wall and out of my way on the desk. I put a large empty can or cardboard tube between the printer and the tray, and the paper never touches the cables.

Barry L. Cohen
New York, NY

$274 More on call-waiting—Call-waiting is a telephone feature that can cut you off if another call comes in while you are on-line with your modem. There's usually some way of temporarily disabling the feature, such as by using call-forwarding to automatically intercept incoming calls. But call-waiting is implemented differently by different telephone companies, and no one method will work in all parts of the country.

Here in southern Wisconsin, you dial *70, wait for the dial tone, then dial your own number. Anyone trying to call you then gets a busy signal until you complete your call. As soon as you hang up, the *70 is disabled, and you have the normal call-waiting feature available again.

If you need information on this subject, the best thing to do is call your local telephone company. If you ask to speak to a switching foreman or a repair foreman, the chances are you'll find somebody who can help you. But, if at first you don't succeed, try, try again.

Walt Grosch, KZ9F
Milwaukee, WI

$275 School days—Have you tried to teach your parents how to use the computer, only to have them walk away furious? Well, here are some of the do's and don'ts of teaching them.

Don't tell them they're dumb or slow or how fast you learned to use the computer.

Don't expect them to remember long commands. Give them one command at a time.

Don't hog the controls, trying to show off. They know you can use the computer or they wouldn't be there.

Do show them applications they're interested in, like word processing.

Do keep them going if they seem interested in a specific program or concept.

Do be patient with them. You weren't a computer whiz in ten minutes, either.

Use your knowledge wisely.

Nick Luggerio
Kingwood, TX

$276 Easy Script tip—Since this program uses the left-arrow key for cursor control, it's not readily apparent what to do if you want to put a left-arrow character in your text. Control 7 will do the job.

Michael A. Packer
Washington, WV

$277 Fast Load re-enable—Documentation for the popular Epyx Fast Load cartridge says that once it is disabled, the only way to re-enable the cartridge is to reset the computer. I've found a second way to re-enable it. Just enter SYS 57194.

Bryan K. Davidson
Clovis, NM

Circle 302 on Reader Service card

TELEMESSAGE
C-64 BULLETIN BOARD SYSTEM
THE PROFESSIONAL APPROACH TO ELECTRONIC MAIL!

FULL FEATURED:

- Software clock and calendar
- Stores up to 100 private messages
- Private file for msgs to the SYSOP
- Automatic Mail—search at logon
- Solid CRASH PROOF design
- Automatic error recovery
- Easily customized
- UP LOAD/DOWN LOAD
- Eight Information Areas
- On-line membership application
- Operates in standard ASCII
- Capacity for 100 members
- Private and public messages
- Logs a record of each call
- Includes the popular chat mode
- Menu driven and very User Friendly
- Includes five support programs
- Detailed operations manual

SECURITY:

Our system has security features that rival the large information services. No need for concern about callers abusing or crashing TELEMESSAGE!

BUSINESS APPLICATIONS:

Many of our customers use TELEMESSAGE to advertise and process orders. With our system your customers can shop 24 hours a day!

HARDWARE REQUIREMENTS:

1-Compatible with most auto answer modems including the Commodore 1650, Westridge and Hayes.
2-Works with either the MSD SD-2 or two Commodore 1541 disk drives. (Specify your disk drive model when ordering)

You get all of these features plus six programs, for only **$79.50**. Make payment by check or money order. (add $3.00 for C.O.D. orders)

TAILORED SOLUTIONS
P.O. BOX 183, WASHINGTON, D.C. 20044
PHONE (703) 845-8576 BROCHURE AVAILABLE

Circle 60 on Reader Service card.

ATTENTION

RS232 PRINTER USERS

PRINTMASTER/S
With IntelliFeatures
Advanced RS232 Printer Interface

ANNOUNCING

The PRINTMASTER/S

Advanced RS232 Printer Interface

Until now, very few commercial programs could be used with your RS232 Printer. Many Commodore programs on the market (such as Multiplan, Homeword, Write-Now) don't allow you to use a printer hooked up to the computer USER I/O port (RS232). Now with the release of the PRINTMASTER/S Advanced RS232 Printer Interface, your RS232 printer is compatible with all your software. The PRINTMASTER/S hooks up to the Commodore serial bus, which is the standard printer connection for all software. The PRINTMASTER/S provides full RS232 signals (pins 2 thru 8, and 20) with full plus and minus voltage levels for complete compatibility with any standard RS232 printer. Switch selectable for 300, 600, 1200, 2400 baud, parity, word, etc. DTR handshaking. The PRINTMASTER/S supports all standard Commodore printer features, including graphics characters and screen dumps on Epson, Gemini, Tally, Okidata, NEC, DEC, Prowriter, Gorilla, and more. The PRINTMASTER/S can be powered by the computer cassette port, or an external power supply. The 3 foot RS232 cable comes with your choice of male or female DB25 (please specify). Compatible with the C128 in all modes. Many additional features. Only **$119.95!**

See your local dealer or

CALL (206) 236-2983

30 day money back guarantee on all products. Visa and MC welcome. Write to us if you wish to be on a special marketing survey mailing list. **DEALERS CALL US!**

Omnitronix

P.O. BOX 43-DEPT.R9-MERCER IS., WA 98040

Circle 122 on Reader Service card.

COMPBANK—64

- REPLACES YOUR MANUAL CHECKBOOK.
- PRINTS CHECKS!!!
- STORES DATA FOR LATER USE.
- KEEPS TRACK OF CHECKS OUTSTANDING.
- LISTS BY DATE OR ACCOUNT NUMBER ON SCREEN OR PRINTER.
- AUTOMATIC RECONCILATION.

ORDER COMPBANK—64
$19.95 PLUS $2.00 S&H
FLA. RES. ADD 5% TAX

INCLUDES MANUAL

SUNRISE
SOFTWARE

8901 NW 26 ST
SUNRISE, FL 33322

MUST LIQUIDATE!

LIMITED INVENTORY OF ULTRA FAMOUS

64K COMPUTERS

AT FAR BELOW DEALER COST!

A GREAT GIFT FOR STUDENTS!
Factory Reconditioned with Warranty.

Monitor is not available. See footnote.*

Millions sold at regular prices . . . and STILL being sold at regular prices!

Sorry, we're NOT permitted to print the brand name. But if you phone us, all details can be divulged.

Phone Toll-Free: 1-800-328-0609

PLENTY OF SOFTWARE AVAILABLE! Thousands upon thousands of programs are available for it from computer stores across the nation.

FOR BUSINESS! This is an ideal entry level business computer. Use the computer for word processing, data base, accounts payable/receivable, general ledger, payroll, inventory, tax accounting, spreadsheets, mailing lists . . . and much, **MUCH** more!

FOR EDUCATION! Perfect for everyone from Ph.D. candidates to preschool youngsters. A vast number of programs are available to challenge and educate the mind.

FOR HOME! Use for analysis of personal investments, income tax planning, storage of recipes and household data. And of course, there are **hundreds** of exciting, fast-paced arcade games available!

Units sold SINGLY or in any combination you desire.	Original List Price	YOUR COST
64K COMPUTER Item H-828-63553-00	$200.00	**$99**
DISK DRIVE Item H-828-63553-01	$269.00	**$149**
PRINTER Item H-828-63831-00	$200.00	**$118**
We reserve the right to limit quantity purchases. **TOTAL**	$669.00	**$366**

COMPUTER
64K RAM. 20K ROM standard (includes operating systems and BASIC interpreter). Text characters. High resolution graphics. 320 x 200 pixels. Music synthesizer produces 3 independent voices, each with a range of 9 octaves.

Typewriter keyboard with 66 keys for upper and lower case letters, numerals, symbols, reverse characters. 2 cursor control keys. 4 function keys, programmable to 8. Input/output ports for user, serial, ROM cartridge, 2 joystick/paddles, video, cassette drive interface. 16 background, border, character colors.

DISK DRIVE
Intelligent, high-speed. External 5¼" floppy diskette recorder. 2K RAM, 16K ROM. Maximum storage of 170K formatted data; 35 tracks. Uses single sided, single density disk. Serial interface. Second serial port for chaining second drive or printer. Data transfer rate of 400 bytes per second.

DOT MATRIX PRINTER
Bi-directional 6x7 dot matrix impact printer. 60 characters per second. Has upper and lower case letters, numerals and symbols. All PET graphic characters. Standard friction feed. Maximum of 80 columns width, dot addressable. CBM ASCII character codes. Original plus maximum of two copies. Paper width: 4.5" to 8.5". Size: 13"W x 8"D x 3¼"H. Weight: 6½ lbs. Power requirements: 120 volts AC, 60 Hz.

Factory Reconditioned With Factory Warranty.

*NOTE: If you do not have a monitor, you can use your TV as a display unit. The computer comes already to be hooked up to your TV.

Credit card customers can order by phone, 24 hours a day, 7 days a week

VISA MasterCard

Toll-Free: 1-800-328-0609

TeleCheck Your check is welcome! No delays in orders paid by check.

C.O.M.B. CO.®
Authorized Liquidator
14605 28TH AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55441-3397

C.O.M.B. CO.® Item H-828
14605 28th Ave. N./Minneapolis, MN 55441-3397

Send the following items. (Indicate quantity of each.)
___64K Computer(s) Item H-828-63553-00 at $99 each plus $8 each for shipping and handling.
___Disk Drive(s) Item H-828-63553-01 at $149 each plus $8 each for shipping and handling.
___Printer(s) Item H-828-63831-00 at $118 each plus $7 each for shipping and handling.

(Minnesota residents add 6% sales tax. Allow 3-4 weeks for delivery. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)

Charge: ☐ MasterCard® ☐ VISA

Acct. No. ______________ Exp. ______
PLEASE PRINT CLEARLY
Name ______________
Address ______________
City ______________
State ______________ ZIP ______
Phone ______________
Sign here ______________

Circle 201 on Reader Service card.

STOP SOFTWARE PIRACY Using Safeguard 64 Disks

- Renders Bit and Nibbler Copiers Ineffective
- Software is Encrypted and Protected on Each Disk
- For Commodore 64

Why should your valuable data or useful software program become available in the Public Domain?

Call or write for more information.

GLENCO ENGINEERING INC.
3920 Ridge / Arlington Hts., IL 60004
(312) 392-2492

Circle 205 on Reader Service card.

VCR USERS:
AT LAST—AN ANSWER !

Use your computer to:

- *immediately locate anything you have on your tapes.*
- *generate a list of exactly what you have on your tapes, either alphabetically or in order of length.*
- *instantly find the best spot on your tapes to record new material.*
- *be certain that you won't accidentally erase something you don't want to.*
- *and much, much more, quickly and effortlessly,*

with **VideoFile,** the first and only computer program specifically designed to solve all the problems of the home video user. **VideoFile** is so logically written and fun to use, any member of the family can learn to use it in minutes! Say goodbye to the scraps of paper and the messy scribbled tape boxes, and get **VideoFile!**

Realizing that **VideoFile** is its own best salesman, we've prepared a demo disk for $10.00 (return it for $10.00 credit towards **VideoFile**!)

Available now: **VideoFile** for the Commodore-64. Due in October: **VideoFiles** for IBM compatibles and Apple II.

VideoFile
Box 480210, Dept. R1, Los Angeles, CA 90048

☐ Send **VideoFile** disk for the C-64. ($49.95)
☐ Send **VideoFile** C-64 demo disk. ($10.00)
☐ Please let me know when **VideoFile** is available for: ☐ IBM compatibles ☐ Apple II

Name
Address
City State Zip
(CA residents must include $3.25 tax, $0.65 for the demo)

From p. 18.

fect. The winner in each category will receive a prize of more than $1000, as well as a computer for use in the classroom. All entrants will receive a prize. Winners' books will be published and distributed by Woodbury and Grolier. The contest will run from October 15, 1985 until January 15, 1986.

Skyfox

B

This Combat Flight Simulator is Pure And Simple Fun

Although Skyfox may not be the most realistic aerial combat game available, it's definitely one of the most exciting. Not only can Skyfox accelerate to 3000 mph before you can say "thermonuclear device," but the plane is equipped with everything a federation pilot needs to defend his home asteroid base against enemy invasion.

The cockpit instrumentation features digital readouts displaying total elasped time since the beginning of a mission, speed in miles-per-hour, altitude, compass heading, your current coordinates according to the base computer's tactical map, and the number of remaining guided and heat-seeking missiles in the hold. Graphic indicators let you monitor your fuel consumption and shield strength, as well as the status of the plane's automatic pilot. Finally, a radar scanner provides either an overhead or forward view of the area you're patrolling.

Once you've become familiar with the instrumentation and weapons systems, you have a choice of fifteen different scenarios. When Skyfox is launched, you can select either a high- or low-altitude course, depending on whether you want to first involve the enemy jets in aerial combat, or, instead, fly a strafing mission against oncoming tanks and hovering ships.

For all of Skyfox's advanced features, however, it's not a particularly difficult fighter to fly. For instance, no matter how you jostle your joystick, the plane seems to remain perfectly level while climbing, diving or turning. Therefore, maneuvers such as rolls and loops are out of the question. In fact, on the easiest level (there are five in all), you can hit ground repeatedly without even diminishing your shield strength.

What Skyfox lacks in realism, however, it makes up for with colorful, detailed graphics animation and exciting sound effects. Enemy planes and tanks are fully drawn as solid images rather than simple outlines. Motherships hover like floating cities over the asteroid landscape, and explosions look and sound remarkably true-to-life.

It should be understood that Skyfox doesn't pretend to be a realistic simulation of anything. It's simply a fast-paced, arcade-style game that puts you in the cockpit of a powerful flying machine. If you enjoy blasting your way through enemy-filled skies without worrying about your jet disintegrating at maximum speed, then Skyfox is your kind of plane. *(Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. C-64/$34.95 disk.)*

Bob Guerra
Charlestown, MA

Paperback Writer 64

A

Here's a High Quality Word Processor for Your Commodore 64

First-rate word processing software for the Commodore 64 has continued to become more readily available at lower prices. The recent release of Paperback Writer 64 would seem to be the best evidence of just how far this software has come. (Although the list price is $100, the program is available from several distributors for approximately $40.)

This program is not only among the best of the word processors available for the C-64, it's one of the best that I've seen running on any microcomputer. It gives the previous heavyweights of word processing some true competition.

Paperback Writer 64 offers features that are truly remarkable, given the constraints of 40-column hardware and 64K memory. Such features include all of the usual editing operations, complete on-screen formatting, true word wrap in the editing mode, mail merge, global file capabilities, complete support of disk operations and a spelling checker.

The program's only real limitations are a small (7K) text buffer (an unavoidable tradeoff when attempting to pack this much power into the C-64's memory space), and a somewhat slow screen speed when operating in the 80-column mode. This second drawback is a result of the program's use of bit-mapped characters, which allows the software to overcome the C-64's 40-column limitations. I sometimes found this slowness irritating.

The basic setup of Paperback Writer 64 is somewhat different from that of several top-of-the-line text processors for the C-64 in that it is not a post-formatted system. This means that text is formatted on screen, rather than during the printing out of a document, through the use of formatting commands embedded in the text. What you see on the screen is exactly what will appear when the document is printed out.

The program's formatting and character codes are completely compatible with those of PaperClip 64, Word Pro +3 and Fleet System, so you can load files from those systems directly into Paperback Writer, without altering anything, and the screen formatting will be exactly the same.

There are useful help screens available, and more detailed explanations of functions are available as help files loaded in from the master disk. The manual is clear and concise, and the key sequences for both cursor control and text manipulation are logical and mnemonic, making them easy to learn and remember. At the time of this writing, a dictionary disk for the spelling checker was forthcoming; I had to create my own disk, entry by entry, which was a slight annoyance.

I wish there were more custom printer files on the master disk. My printer (an Okidata 92) was not supported by the existing files, so I had to create my own file. I also would like to see the copy-protection scheme changed, as it cannot be read by the DOS if you have 1541 Flash! installed. The copy-protection also may not be read properly if you have a non-Commodore disk drive.

These are all minor criticisms of what is clearly a first-rate piece of work. Although it may be impossible to say which of a number of very good word processors for the C-64 is the best, this one certainly ranks among them. Anyone owning a C-64 and looking for very sophisticated word processing should give Paperback Writer 64 serious consideration. *(Digital Solutions, PO Box 345, Station A, Willowdale, Ontario, Canada M2N 5S9. C-64/$100 disk.)*

Douglas Watt
Natick, MA

Circle 90 on Reader Service card.

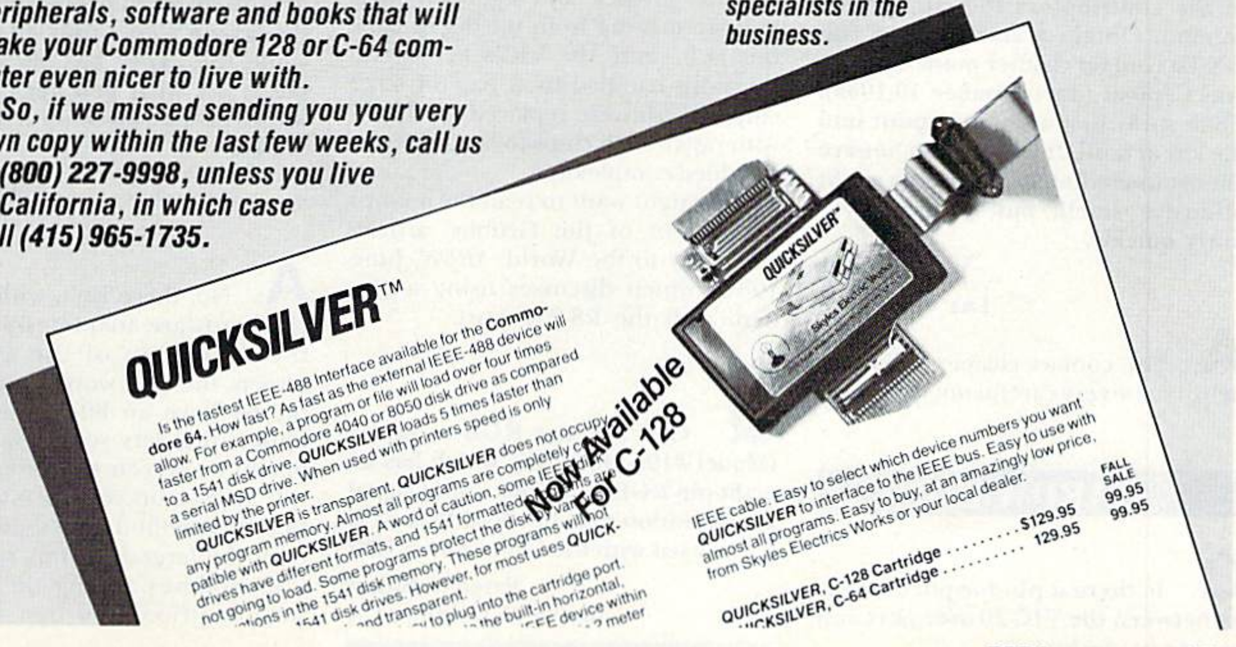
FOR COMMODORE 128 AND C-64 OWNERS ONLY:

This is just 1 of 15 pages of the newest and biggest Skyles catalog, hot off the press. We know you'll want this page, in its full 8½ x 11 splendor, and another 14 pages of peripherals, software and books that will make your Commodore 128 or C-64 computer even nicer to live with.

So, if we missed sending you your very own copy within the last few weeks, call us at (800) 227-9998, unless you live in California, in which case call (415) 965-1735.

Skyles Electric Works
231E South Whisman Road
Mountain View, CA 94041

From Skyles Electric Works, the oldest and largest professional specialists in the business.



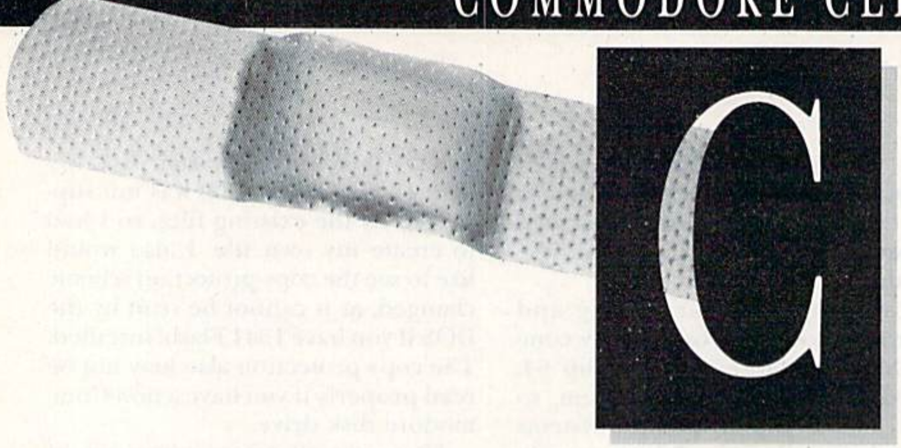
QUICKSILVER™

Is the fastest IEEE-488 Interface available for the **Commodore 64**. How fast? As fast as the external IEEE-488 device will allow. For example, a program or file will load over four times faster from a Commodore 4040 or 8050 disk drive as compared to a 1541 disk drive. **QUICKSILVER** loads 5 times faster than a serial MSD drive. When used with printers speed is only limited by the printer.

QUICKSILVER is transparent. **QUICKSILVER** does not occupy any program memory. Almost all programs are completely c[illegible] patible with **QUICKSILVER**. A word of caution, some IEE[illegible] disk drives have different formats, and 1541 formatted [illegible] are not going to load. Some programs protect the disk [illegible] variations in the 1541 disk memory. These programs will not [illegible] 1541 disk drives. However, for most uses **QUICK**[illegible] and transparent. [illegible] to plug into the cartridge port. [illegible] the built-in horizontal, [illegible] IEEE device within [illegible] 2 meter IEEE cable. Easy to select which device numbers you want **QUICKSILVER** to interface to the IEEE bus. Easy to use with almost all programs. Easy to buy, at an amazingly low price, from Skyles Electrics Works or your local dealer.

		FALL SALE
QUICKSILVER, C-128 Cartridge	$129.95	99.95
[illegible]ICKSILVER, C-64 Cartridge	129.95	99.95

COMMODORE CLINIC



By *JIM STRASMA*

Do you have a problem or question about your Commodore computer? Commodore Clinic can help. Just send your question (limit one per entry) on a postcard to:

Jim Strasma
Commodore Clinic
Box 6100
Macomb, IL 61455

Queries are answered only through this column, but, due to the volume of mail, only those questions that appeal to the majority of our readers will be published. Please do not enclose a self-addressed stamped envelope, since we cannot provide personal responses nor answer questions before publication.

UPDATE

Update: I have the solution to the "key bounce" problem posed by one of the contributors to your August column. Obtain a small can of DEOX-ID contact cleaner made by General Cement (part number 10-1906). Then spray just a small amount into the key at fault. It will stop all bounce almost immediately. There is a slight offensive smell, but it goes away fairly quickly.

Roy Holland
Las Vegas, NV

A: Yes, contact cleaner will often help, but be very careful not to overdo.

HARDWARE

Q: **Is there a pin-for-pin similarity between the VIC-20 user port and the same outlet on the Commodore 64? I am trying to use my ham radio RTTY equipment on a newly acquired 64, but cannot find any information on the chips used in the VIC vs. the 64 or about their connections. The diagram in the *VIC-20 Programmer's Reference Guide* doesn't help.**

Al Michelis
Plymouth, MI

A: The user ports on the VIC and 64 are similar enough that both can use the same modems and RS-232 cartridges, for example, but the ports are not identical. Raeto West covers this point nicely in his new book, *Programming the Commodore 64*. He says that the 64 user port has CIA counter lines, unlike the VIC, and that the VIC port has cassette, joystick and light-pen lines that are missing from the 64. In part, this is because the VIC's I/O operations are handled by a pair of 6522 chips, which were replaced on the 64 with faster 6526 chips to keep up with its added complexity.

You might want to read the second installment of Jim Grubbs' article, "Gateway to the World" (*RUN*, June 1984), which discusses using a modem with the RS-232 port.

Q: **Can a Sears RGB monitor (Model #195-21353452), which has an eight-pin RGB input jack (input signal configuration matches IBM PC or PC jr), be used with the Commodore 128?**

Peter C. Shinn
Rowland Heights, CA

A: Yes, the two should be compatible. I've tested the Sears monitor with good results. It has the further advantage of including a regular TV tuner for watching regular broadcasts. Since the video resolution of the one I tested didn't quite match that of Commodore's 1902 monitor, you should double-check the display you buy for sharpness and clarity. (Any monitor not specifically built for your computer may need adjusting to work properly with it. The last time I bought a monitor, it took two service calls under warranty to get a well-focused, properly centered image.)

Q: **As a novice shopping for my first computer, I was advised to avoid the Commodore 64 computer if planning to do word processing, because the screen shows only 40 characters while the paper has 80. (What you see is *not* what you get.) Is there a way to have an 80-column screen with the 64?**

Estes Gregory
McCall, ID

A: No, there isn't, without a special hardware adapter. But, to offset the limitation of the 40-column screen, the best word processors for the 64 have an 80-column preview option that lets you view your document on screen almost exactly as it will appear on your printout. You'll find this method works quite well for even the largest documents, making Commodores among the most reasonably priced and best small com-

Circle 243 on Reader Service card.

COMMODORE 64

THE RECIPE BOX

Now you can easily store and recall your favorite recipes on your Commodore computer. THE RECIPE BOX is a complete menu-driven disk system that comes with these additional features:

SEARCH BY INGREDIENT—Only have a pound of hamburger in the freezer? Let THE RECIPE BOX show you all the recipes that you have on file that use hamburger, or any other ingredient you choose.

SEARCH BY CATEGORY—Code your recipes as to breakfast, lunch, dinner, snacks, etc.

SEARCH BY CATEGORY/INGREDIENT—Any combination of the above.

AUTOMATIC MEASUREMENT—THE RECIPE BOX will automatically scale up or down the amount of ingredients you need according to how many servings you want.

SCREEN OR PRINTED OUTPUT—Have printed copies to use in the kitchen or give to friends.

THE RECIPE BOX requires one disk drive and an optional 1521 compatible printer. Send check or money order for $24.95 to:

Aries Marketing Co.
P.O. Box 4196
4200 Shannon Drive
Baltimore, MD 21205
Md. residents add 5% sales tax
DEALER INQUIRES INVITED

Circle 232 on Reader Service card.

DISKS 69¢

Foolish to pay more.
Dangerous to pay less.

- QUALITY MEDIA
- LIFETIME REPLACEMENT GUARANTEE
- HUB RINGS
- TYVEC EPS.
- WRITE PROTECTS

	1+	50+	100+	250+	500+	1000+
5.25" SSDD	.95	.89	.85	.79	.75	.69
5.25" DSDD	1.10	.99	.95	.89	.85	.79
PC FORMATTED	1.35	1.29	1.25	1.20	1.10	1.05
AT 1.2MB	3.00	2.89	2.49	2.39	2.19	2.09
3.5" 1D (For Mac)	2.70	2.60	1.99			
3.5" 2D (For HP)	3.50	3.25		3.15	CALL	CALL

BLACKSHIP
COMPUTER SUPPLY

P.O. Box 883362
San Francisco, CA 94188
In California 415-550-0512
USA orders **800-431-6249**
In Canada 403-428-6229

Add $3.00 shipping and handling per 100 Diskettes.
COD add $1.95. (CA residents add 6.5% sales tax)
VISA/MC/COD

Circle 211 on Reader Service card.

DMS

DISK MANAGEMENT SYSTEM

What is DMS?

- DMS is a utility and data base program which catalogues your entire software collection onto one disk.

What will DMS do for you?

- DMS will increase your productivity by organizing your software thus reducing the time you spend searching for files.
- DMS will automatically execute documented and undocumented Commodore disk file commands for you.
- DMS will provide password protection for your confidential programs and data.

DMS does ALL this for only $34.95

Please add $2.00 ($4.00 Foreign) postage and handling
Send check or money order to

Cursor Products
RR 71 Box 1858
Camdenton, MO 65020
MO res. add 4.725 % sales tax

Circle 39 on Reader Service card.

ABBY'S

DISCOUNT SOFTWARE

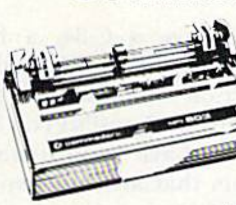
37 S. Broad Street, Fairborn, OH 45324

ORDERS ONLY:
1-800-282-0333

CUSTOMER SERVICE & OHIO ORDERS:
1-513-879-9699

Mon.-Fri. 10 a.m.-7 p.m.; Sat. 10-3 ET

ABBY'S SPECTACULAR COMMODORE MPS 803 SALE



ONLY $7995

RETAILS FOR $149.95
YOU SAVE $70 WITH ABBY's

We are a full-line Commodore dealer.
Call us about software for C-128 and Amiga.
We carry Toshiba VCR's. Call for price.

SOFTWARE HITS

Phantasie	$27
Sky Fox	$24
Adventure Construction Set	$28
Graphic Library 1 & 2	ea. $18
Print Shop	$35
Hacker	$24
Winter Games	$24
Master of Lamps	$24
Countdown to Shutdown	$24
Alcazar	$24
Vizastar (8K)	$89

SOFTWARE ONLY — Prepaid orders over $50 receive free shipping via UPS in continental U.S. Please add $2 orders under $50. Hardware and all orders requiring shipment via U.S. Post Office are subject to additional freight charges. Add $5 for COD orders. VISA/MasterCard orders under $15 add $1 service charge. Ohio residents add 5.5% sales tax. Personal checks require a three-week waiting period. No waiting when paid by credit card, certified check or money order. All items subject to availability and price change. PLEASE CITE AD NUMBER WHEN ORDERING. WE CHECK FOR STOLEN VISA & MC.

AD #R-115

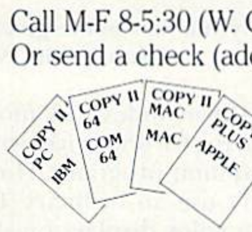
Circle 81 on Reader Service card.

BACKUP PROTECTED SOFTWARE *FAST* with COPY II 64™

From the team who brought you **COPY II PLUS** (Apple), **COPY II PC** (IBM) and **COPY II MAC** (Macintosh) comes a revolutionary new copy program for the Commodore 64, **COPY II 64** ver. 2.0!

- Copies most* protected software — *automatically.*
- Copies even protected disks in just 2 minutes (single 1541 drive).
- Copies even protected disks in just 1 minute (dual 1541 drive).
- Maximum of four disk swaps on a single drive.
- Copies half and full tracks.

Call M-F 8-5:30 (W. Coast time) with your VISA MasterCard : **503/244-5782.**
Or send a check (add $3 s/h, $8 overseas) to



$39.95

CENTRAL POINT Software, Inc.
9700 SW Capitol Hwy. #100
Portland, OR 97219

*We update Copy II 64 regularly to handle new protections; you as a registered owner may update at any time at a reduced price.

This product is provided for the purpose of enabling you to make archival copies only.

puters for word processing despite the 40-column limitation.

Although good 80-column hardware adapters are also available for the 64 and are compatible with some of the best word processing programs, if you really want 80 columns all the time, you will be happier with the Commodore 128 and an 80-column monitor. You will find that excellent new versions of popular word processors are already available for it, taking full advantage of its added screen width and text memory. Beyond that, Commodore's new Amiga can, via an emulator, run most word processors written for the IBM PC, some of which are, to date, slightly more advanced than word processing programs available for the C-64.

Q: I own a VIC-20. In your January 1985 column, I read about the 65C02 and W65SC802 chips for upgrading the VIC. Your answer was informative but said nothing about where I could find them or about how much one would cost. If you could supply me with this information, I would be grateful.

Also, I'm kind of confused about the compatibility of the W65SC802 with the IBM computer—will I be able to use IBM software with my VIC? Is this the same as a CP/M cartridge for the VIC?

Travis Seymour
College Park, GA

A: 65C02 chips should be available through any Apple dealer now, as they are used in the Apple IIc computer. I have not seen the W65SC802 listed in chip catalogs yet, but you or your electronics supplier should be able to obtain one directly from the maker I previously mentioned—Western Design Center, in Mesa, AZ. The W65SC802 could easily cost $100; a 65C02 will cost closer to $10.

As for compatibility, although the W65SC802 has 16-bit registers like the 8088 chip used in the IBM PC, that most definitely does *not* make it IBM-compatible. It is also not compatible with the Z-80 chip used by CP/M-80. Think of both of these new chips as fun devices for your own programming experiments, rather than as interfaces to alien computers.

Q: I have a C-64, a 1541 disk drive, a Pro-Writer 8510 and Tymac's Connection interface. I just purchased Broderbund's Print Shop program and have been unable to get printouts that are full paper width. The graphics are too narrow as well. Any ideas?

L.B. Smithe
Quincy, IL

A: Your problem is probably in the settings of your interface, since my other equipment is identical to yours and the program worked properly here. Be sure you set your interface to its Transparent mode when using it with any program that explicitly supports your printer. Otherwise, both your program and your interface will be attempting to make the needed translations to use your printer with your 64, creating some strange results.

If you don't want to change switch settings, set your interface to make the printer emulate a Commodore 1525 printer, and from then on choose the 1525 printer option in all programs, rather than Pro-Writer options.

This same technique applies to users of all printers connected to Commodore computers by intelligent interfaces when running programs that support non-Commodore printers.

Q: Do you have to buy a monitor with the C-128, or can you hook up the computer to a regular TV; and what are the advantages of having a monitor?

Johnny (no last name given)
Sunnyside, NY

A: The C-128 includes a TV modulator, just like the 64, and works with a TV for 40-column programs. However, you can't use an ordinary TV for 80-column color displays on the C-128. For that, you'll either need an RGBI monitor, such as Commodore's promised new 1902, or any monochrome composite monitor connected via a cable Commodore will provide. You will also notice that a video monitor gives a sharper picture with purer, brighter colors than most TVs and is free from most kinds of interference.

Q: I would like to know if the 1541 disk drive works with the new C-128.

Sidney Gellvian
New York, NY

A: Yes. You can use the 1541 with the C-128 in the C-64 and the C-128 (40- and 80-column) modes. Also, you can use the 1541 to run CP/M programs in Commodore GCR format, but not as quickly as on a 1571. Only new programs designed specifically for the 1571's added storage capacity or its Kaypro-compatible CP/M disk format are likely to give trouble on a 1541.

SOFTWARE

Q: A short time ago you published a machine-code program for sorting alphabetically. It would be very much appreciated if you would give us the same kind of program for a numerical sort.

N.H. Sumner
Valley Center, CA

A: Actually, I wrote that sort five years ago, for the Commodore PET. In various editions, it has been known as Keysort, Supersort and Subsort. Most versions automatically include the ability to sort numeric arrays as easily as string arrays, and the latest experimental version supports all Commodore machines, from the first PET through the 64, though not the C-128 or Plus/4. It is still available directly from me for $35, but it's only intended for people skilled enough in Basic programming to use arrays.

Q: I love my Commodore Plus/4 and its built-in software. However,

Circle 143 on Reader Service card.

3 GREAT NEW C64/C128 PROGRAMS!

DESK-PAD! • $17.95

Perfect for your home office, call up an appointment calendar, a calculator with memory and scientific notation, and 2 handy notepads, all with just ONE keystroke. Plus color-icon display, disk filing, mini-databases, and more!

CRYPTO MASTER • $24.95

Very fast and powerful, this 32-digit key secret cipher allows complete privacy of your word processing or disk data files.

ADVISOR EXPERT SYSTEM DESIGNER

The one you've been reading about...! Create "Expert" systems using the friendly THINK! language. Great for serious engineering as well as education. Includes backward and forward chaining, 4-window color inference display PLUS room for 255 rules and 127 logic variables. Why pay thousands more? **Introductory Price: $89.50**

PAYMENT: CHECK OR MONEY ORDER
ADD $2.00 SHIPPING & HANDLING
CALIF. RES. ADD 6% SALES TAX
PLEASE ALLOW 6-8 WEEKS DELIVERY

MEGAGEM

313 E. Surfside, Port Hueneme, CA 93041

Dealer Inquiries Invited!

Circle 117 on Reader Service card.

STOP SOFTWARE PIRATES IN THEIR TRACKS

- Renders BIT,NIBBLE & HARDWARE COPIERS ineffective.
- Also ENCRYPTS your program for additional security.

Why Should your treasures become property of the public domaine?

For information please write to:

ZAPP SOFTWARE
P.O. BOX 1328
ELMHURST, IL. 60126

CONVERSE WITH YOUR COMPUTER

ELIZA-64

Artificial Intelligence Demonstration Program

BREAK from games and technical programs and AMAZE and INVOLVE your family and friends.

Eliza-64 is a Commodore 64 adaptation of the famous Eliza program developed at MIT. Eliza acts as a psychotherapist analyzing your input and responding with an appropriate comment or question.

GREAT FAMILY AND PARTY ENTERTAINMENT

NOW ONLY $19.95

Ohio residents add 5½% sales tax.

To order call Toll Free 1-800-638-2000
or send check or money order to:

OMEGA-SOFT
P.O. Box 3686 Dept. R
Mansfield, OH 44907

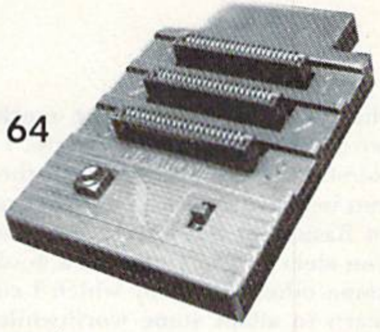
VISA

Disc Only *Machine Language Fast*

(dealer inquiries invited)

SPECIAL INTRODUCTORY OFFER $24.95 (includes shipping)

EXPAND YOUR COMMODORE 64 WITH A 3-SLOT CARTRIDGE EXPANDER



— Eliminates wear on connectors
— Saves time when changing cartridges
— Built in Reset button
— Holds up to 3 cartridges
— Convenient access to cartridges

Are you tired of turning your Commodore 64 computer upside down just to insert or change a cartridge? Then you need the new Cartridge Expander from Navarone. We have been making these units for the TI-99/4A home computer for over three years, and now have the same high quality product available for your Commodore 64.

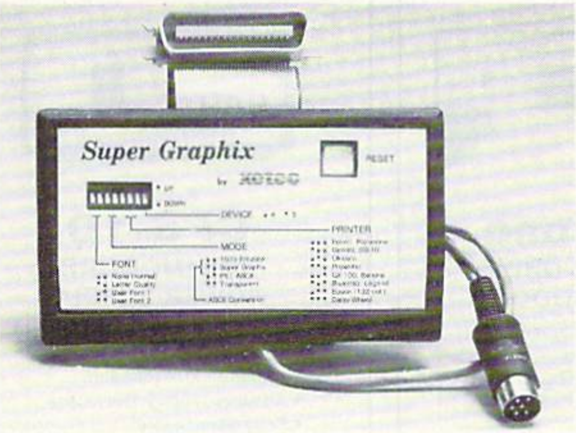
NAVARONE

Take advantage of our introductory offer **NOW**

TO ORDER: Send Cashier's Check or M.O. or personal check (allow 10 days to clear), to Navarone Industries, Inc. 19968 El Ray Lane, Sonora, CA 95370 or call (209) 533-8349. For MASTER/VISA CARDS and C.O.D.'s add 3%. CA Residents please add 6.5% Sales tax. Outside US add $2.00 for Shipping.

Circle 96 on Reader Service card.

Super Graphix



You Asked For It . . . Here It Is!!!

GRAPHICS and FONTS plus an 8K BUFFER for the ultimate in performance and speed. The XETEC Super Graphix interface for Commodore Computers now offers a new high in technology with these features:

- 8K Buffer Standard
- 10 Printing Modes
- 3 Internal Screen Dumps
- Extensive Command Channel
- Reset Button to Halt Printing from Buffer
- Switch Settings on Label for Quick Reference
- Correspondence Quality Font Built-In
- Capable of Storing 2 Additional Fonts
- Correct Graphics/Text Aspect Ratio for all Major Printers
- 8 Active Switches with Changes Constantly Monitored
- Internal Fonts Support Super-script, Sub-script, Underlining, Bold-face and Choice of 9 Pitches

Suggested list $99.95 • Includes Lifetime Warranty

xetec, Inc. / 3010 Arnold Rd. / Salina, KS 67401 / 913-827-0685

the C-64 seems to be the machine with all the available software. I understand that programs for the 64 can be "translated" into the version of Basic that the Plus/4 uses. Could you steer this beginner to a book or some other means by which I could learn to adapt some worthwhile 64 programs to my Plus/4?

Mary Hynes
Jamaica, NY

A: So far, the only book I've noticed for the Plus/4 is *The Commodore Plus/4 Book*, from the Howard Sams Co. To order it, ask your dealer, or call 800-428-SAMS. Also, *RUN* will continue to cover the Plus/4.

Q: **I have a Commodore 64 with a cassette and an Alphacom 81 80-column printer. The main reason I bought a computer was so I could set up files for our home business, but I can't even get a letter printed, let alone customers' names and addresses. What should I do to write a letter and then be able to transfer it to my printer?**

Jeannie Reid
Yakima, WA

A: Very few small computers can do what you request when first unpacked. Except for the Plus/4, all Commodore computers need to have an additional program that you can either buy or write yourself, before you can use them to type a letter.

The solution when first starting out is to buy a program that does what you want the computer to do and load that into your computer. The kind of program you'll want for your letters is called a word processor. If you don't have a disk drive yet, I suggest you get a word processor that comes on a cartridge. These simply plug into the back of your 64 while it's turned off. Then, as soon as you turn the computer back on, you're ready to type your letter; to print it, you simply press a few keys.

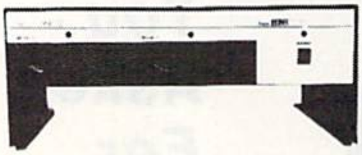
Later, when you want to save letters permanently, you'd do well to get a disk drive for the purpose. That would also give you the ability to load other word processors and mail-list managers, after you've developed a need for their special features.

PROGRAMMING

Q: **I am writing an adventure in which one program loads another. This creates a problem, because the program being loaded must be shorter than the one loading it. I have been avoiding this with REM statements and dummy lines. However, this is very troublesome.**

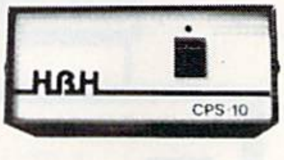
Clinton Allen
Baird, TX

Circle 108 on Reader Service card.



The Clone
DUAL DISC DRIVE FOR COMMODORE

- Commodore 64 Compatible
- 6 Kb Buffer Memory
- 2 Connector Serial Buss
- Daisy Chain Up To 4 Drives
- No Overheat Time
- Formats, Copies and Verifies in Less Than 2 Minutes
- 1 Full Year Warranty



CPS-10
COMMODORE POWER SUPPLY

- Two 100-Watt Outlets
- Surge and Spike Protection
- RFI and EMI Protection
- All Metal, Heavy-Duty Case
- Fully Serviceable
- Perfect Replacement for Commodore Power Supply
- 1 Full Year Warranty

Coming Soon . . .

Single Floppy 10 Mb Hard Disc Clone

Call Collect, TODAY
(618) 344-7912

HBH Sales Company
A DIVISION OF HBH CORPORATION
225 WEST MAIN STREET
COLLINSVILLE, IL 62234

Circle 172 on Reader Service card.

PIANO ROLLS PLAYED BY COMPUTER

ARE YOU KIDDING?!!!

NOW YOU CAN TURN YOUR HOME COMPUTER INTO AN ENTERTAINMENT CENTER AND MUSIC EDUCATION MACHINE. JUST ADD OUR MIDI CABLE AND ANY MIDI INSTRUMENT.*

The appearance of the MIDI on home organs and synthesizers opens up a whole new future for music. QRS player piano rolls from 1900 to present day were performed by great artists from Scott Joplin, Fats Waller, and George Gershwin to Liberace, Peter Nero, and other contemporary artists. Most of this library of over 10,000 songs has been converted to digital signals and placed on floppy disks that are available for popular microcomputers.

THE COMMODORE 64/128 AND APPLE IIc PACKAGES ARE NOW AVAILABLE FOR ONLY $49.95. IT INCLUDES A MIDI INTERFACE AND A SIX SONG SAMPLE DISK WITH CLASSICAL, CONTEMPORARY, SHOW MUSIC, and even **RHAPSODY IN BLUE** played by the composer **GEORGE GERSHWIN** that you can enjoy with your MIDI equipped instrument.* For information about other supported computers, MIDI cables, and Casio MIDI instruments, call or write:

Micro-W
DISTRIBUTING INC

1342B Route 23
Butler, New Jersey 07405

(201) 838-9027

VISA

Dealer & Distributor Inquiries Invited

*For Best performance an eight voice polyphonic instrument is required.
Commodore is a registered trademark of Commodore Business Machines Inc.

Circle 29 on Reader Service card.

HARDWARE

Amiga	Call
1571 Disk Drive	Call
1670 Modem	Call
1902 Monitor	Call
Commodore 64	139.00
1541 Disk Drive	164.00
1702 Monitor	169.00
803 Printers	139.00
803 Tractor Feed	29.95
Modem 300/1660	79.95
Power Packs	29.95
1101 Printer (daisy wheel)	329.00
C-128	Call

PRINTERS

Star SG-10	224.00
SG-10C	239.00
Panasonic 1091	259.00
Axiom Elite 5 (daisy wheel)	249.00
Okidata 182	269.00
Legend 80	179.00

MODEMS

Westridge 6420	69.95
MPP 1064	79.95
Total Telecommunications	39.95
Mighty Mo	79.95

DISKETTES (10-PACKS)

Bulk Disks (Min. 50 pcs.)	.69 ea.
Generic Disks DS/DD	10.00
SKC SS/SD	13.95
SKC SS/DD	15.95
Elephant SS/SD	16.95
Elephant SS/DD	19.95
Elephant DS/DD	24.95
Elephant Premium SS/DD	21.95
Maxell SS/DD	22.95
Maxell DS/DD	29.95
Bonus SS/DD (11-Pack)	12.95

ACCESSORIES

Floppiclene Head Cleaner	14.95
Numeric Keypad	34.95
Monitor Cables	9.00
6 foot I/O Cable	9.00
Paper — (1000 Sheets)	18.00
Joysticks	7.95
Surge Suppressor 6 outlet w/ 6 ft. cord Emz/Rfi filter	49.95
Diskcover 35 (Storage Box)	5.95
Printer Stand	19.95

***We also carry a full line of Covers, Printer Ribbons, Cables, Labels, Storage Cases.**

*We also offer all other Commodore Compatible software. Call for new titles & prices.

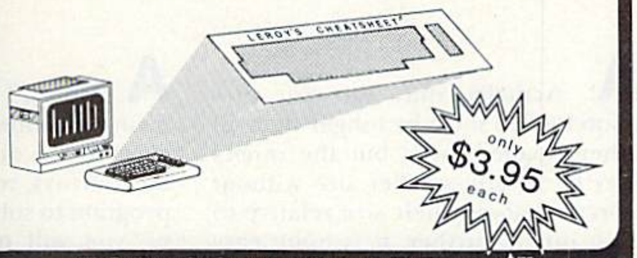
COMPUTER WAREHOUSE

(in FL) 305-274-3680; 1-800-372-0214
7222 S.W. 117th Avenue, Miami, FL 33183

Add 3% ($3 minimum) for shipping and handling charges. FPO's & APO's and overseas subject to additional shipping charges. Ad prices reflect 3% cash discount. Credit card orders should add 3%. Prices and availability subject to change without notice.

Circle 225 on Reader Service card.

LEROY'S CHEATSHEET®
KEYBOARD OVERLAYS



FOR COMMODORE 64tm
(VIC-20 also available)

LEROY'S CHEATSHEETS® are plastic laminated keyboard overlays designed for use with popular software and hardware for Commodore's VIC-20 & C-64 computers.

These cut-it-out yourself overlays are designed to fit over the keyboard surrounding the keys with commands and controls grouped together for easy references.

LEROY'S CHEATSHEETS®
make life easier for you

WORD PROCESSORS

- ☐ Easy Script
- ☐ HES Writer
- ☐ Paper Clip
- ☐ Quick Brown Fox
- ☐ Script 64
- ☐ Speedscript (2.0 & 3.0 GAZETTE)
- ☐ Wordpro 3/PLUS
- ☐ Omniwriter
- ☐ Wordpro 64 (By Steve Punter)
- ☐ Write Now!/64
- ☐ Fleet System 2

SPREADSHEETS

- ☐ Calc Result (advanced)
- ☐ Calc Result (easy)
- ☐ Easy Calc
- ☐ Multiplan
- ☐ PractiCalc 64
- ☐ PRACTICALC II
- ☐ VIZASTAR

DATA BASES

- ☐ The Consultant (Delphi's Oracle)
- ☐ The Manager (CBM)
- ☐ SuperBase 64

PRINTERS

- ☐ Printer, (CBM) 1525, MPS 801, MPS 803
- ☐ Printer, (CBM) 1526, MPS 802
- ☐ Printer, (Epson) RX & FX 80 & 100
- ☐ Printer, (Gemini) 10X - 15X
- ☐ Printer, Okidata 92 & 93

RUN 11

MISCELLANEOUS

- ☐ Blanks (3 each - NOT Laminated)
- ☐ For The Beginner (using the 64)
- ☐ Sprites Only
- ☐ Flight Simulator II
- ☐ Doodle
- ☐ 1541 Disk
- ☐ Sky Travel

LANGUAGES & UTILITIES

- ☐ COMAL
- ☐ SIMON'S BASIC
- ☐ Basic
- ☐ Hesmon 64
- ☐ LOGO (sheet 1)
- ☐ LOGO (sheet 2)
- ☐ Pilot (CBM)

TERMINALS

- ☐ Vidtex
- ☐ The Smart 64 Terminal
- ☐ VIP Terminal
- ☐ Term 64

Qty.___ X $3.95 $______
Shipping & handling $ 1.00
6% sales tax $______
(PA residents only)
TOTAL $______
U.S. FUNDS
NO COD's PLEASE

Dealer inquiries welcome

Name ____________________
Address ____________________
City __________ State ______ Zip ______

CHEATSHEET PRODUCTS INC
P.O. Box 111368 Pittsburgh PA. 15238
VISA master charge
(412) 781-1551

☐ Charge My VISA or Master Card NUMBER ____________ EXPIRATION DATE ______

. . . OR SEE YOUR LOCAL DEALER !

A: Actually, only the *first* program loaded must be longer than all others loaded later, but the others may be of any smaller size without worrying about their size relative to each other. Further, it is quite easy to fool Basic into thinking your first program is much larger than it is. A single line does it for the 64 version of my Mail Disk:

```
1060 POKE 45,0:POKE 46,64:CLR
```

This must appear right at the start of your first program, before you define any variables, because the CLR command will erase all variables. Apart from that small limitation, the only difficult part of using this trick is calculating the correct value to Poke into location 46. To obtain the correct value, store all your programs on disk, see which one occupies the most blocks and load that one into memory. Then type the following line in Immediate mode (without a line number):

```
PRINT PEEK(46)+2
```

The number that appears on your screen as a result is the one you want to Poke into location 46 in your first program.

There are other ways to chain between programs, but this method has the advantage of preserving all dynamic variables for use in programs loaded later. To be sure a string variable is dynamic, define it this way:

```
A$="LAMP ON"+""
```

The concatenation of the two strings forces Basic to make the resulting string dynamic and store it where it won't be disturbed by further program loads.

Q: **I have been requested to establish a schedule for my wife's bridge group. The group varies from 24 to 40 members; they meet once a month, eight months a year. My task is to arrive at a schedule such that no two players play with each other more than once a year. Is such a program available for my 64?**

Thomas Mason
Livermore, CA

A: Sorry, I haven't seen a bridge team selection program yet. However, if you are familiar with using Basic arrays, you can write your own program to solve this problem. To do so, you will need two arrays—one containing all possible ways to pair two of 40 players, and the other containing the actual matchings selected by the computer for each of the eight meetings. Then the computer can randomly select pairings from the first array and move them into the second array, deleting them from the first array at the same time. This automatically eliminates duplicates.

Since you can't be sure in advance who will show up, you will have to let the computer make each month's matches after members arrive that day. The computer can then omit absent members from its matchings.

Yesterday's mail brought a public domain program from Steven Darnold of Blenheim, New Zealand, that may help you get started. The program is called Team Draw, and it organizes sports tournaments, making sure all teams play each other round-robin. Though written for the C-64 and 1525, it can easily be altered for any Commodore machine and most printers. I'd be glad to send a copy for my usual $15 fee.

Q: **I am confused with the logic commands AND and OR. Whenever you encounter A = 96 AND 32, does the A equal the lower number, 32? And when A = 64 OR 32, does A equal the sum of both numbers, 96? Please help me clear up this confusion.**

Bill Goldman
Langhorne, PA

A: To understand the AND and OR commands as used in Basic computer programs, you must realize that they are written in decimal (base 10), but do their work in binary (base 2). To see their effects, you must convert the numbers they use into base 2. Casio and Radio Shack both make inexpensive calculators that do this.

Next, remember that logical commands are not arithmetic. Rather, the AND command defines a set of conditions, *all* of which must be true before the result is true. Similarly, when you're using the OR command, if *either* of two conditions is true, then the result is true.

To put these ideas together and solve one of your examples, remember that a binary 1 is considered true and a binary 0 false. Thus,

```
96 AND 32
```

is the same as:

```
    %01100000
AND %00100000
```

Notice that only one bit (binary digit) is true in both numbers. Therefore, it is the only bit true in the result:

```
%00100000
```

Converted back to decimal, your answer is 32.

The practical value is that the AND and OR commands allow you very precise control of the computer and its memory.

Q: **I like to modify programs, but some programs don't list. Every time I try to list them, they show a SYS (4036) or the word list terminates. Could you show me how to list one of these programs?**

Darren Lee
Vancouver, B.C.
Canada

A: The usual reason such programs do not list is that they were written in a language other than Basic, then assembled or compiled into unlistable machine language. Your clue to such programs is the SYS command in the one line you can list. To study such programs, you'd need to learn 6502 assembly language and then disassemble them with a machine language monitor, starting at the decimal memory address following the word SYS in the list you were able to get.

Another reason some programs don't list is because the author of the program doesn't *want* it listed and has protected it against the usual List command. For example, a teacher may not want students to be able to see the answers to a quiz program by simply listing it. As I've said before, I can't give you any help in studying such programs. R

Circle 55 on Reader Service card.

commodore

COMPUTER PRODUCTS AT . . .
COMPUTER CREATIONS

Call TOLL FREE for Software
Prices Not Listed!!!

ACCESS	
Beach Head 2 (D)	26
Mach 5 (R)	23
Raid Moscow (D)	25
ACTIVISION	
Ghostbusters (D)	23
Great American Cross Country Road Race (D)	21
Hacker (D)	21
Master of the Lamps (D)	21
Mindshadow (D)	19
AVALON HILL	
Panzer Jagd (D)	21
Parthian Kings (D)	19
Super Bowl Sunday (D)	21
Telenguard (D)	19
Tournament Golf (D)	21
BRODERBUND	
Bank St. Writer (D)	33
Champ Loderrunner (D)	23
Karateka (D)	21
Mask of the Sun (D)	26
Print Shop (D)	29
Print Shop Graphics Library #1 (D)	17
Print Shop Graphics Library #2 (D)	17
Stealth (D)	19
DATASOFT	
Alternate Reality (D)	26
Bruce Lee (D)	19
Conan Barbarian (D)	19
Elevator Action (D)	19
Mr. Do (D)	17
Pole Position 2 (D)	19
The Goonies	19
Zorro (D)	19
DAVIDSON	
Math Blaster (D)	33
Speed Reader 2 (D)	43
Spell It (D)	33
Work Attack (D)	33
ELECTRONIC ARTS	
Adventure Const. Set (D)	28
Archon 2 (D)	24
Mail Order Monsters (D)	24
Music Const. Set (D)	17
Murder on the Zinderneuf (D)	17
One-on-One (D)	24
Pinball Const. Set (D)	17
Racing Dest. Set (D)	24
Seven Cities Gold (D)	24
Skyfox (D)	24
EPYX	
Ballblazer (D)	26
Fast Load (R)	25
Jet Combat Simulator	19
Rescue on Fractalus (D)	26
Summer Games 2 (D)	26
Winter Games (D)	26
World's Greatest Football (D)	26
FIRST STAR	
Spy vs. Spy (D)	19
HAYDEN	
Sargon 2 (D)	15
Sargon 3 (D)	33
INFOCOM	
Enchanter (D)	24
Hitchhiker's Guide to the Galaxy (D)	24
Infidel (D)	26
Planetfall (D)	26
Sorcerer (D)	26
Wishbringer (D)	23
Zork I (D)	23
MICROPROSE	
Acro Jet: Advanced Flight Simulator (D)	Call
Crusade Europe (D)	26
Decision in Desert (D)	26
F-15 Strike Eagle (D)	21
Gun Ship: The Helicopter Simulation (D)	Call
Kennedy Approach (D)	23
Silent Service: Submarine Simulation (D)	Call
MINDSCAPE	
Bank St. Music Writer (D)	26
Halley Project (D)	26
Perfect Score SAT (D)	49
ORIGIN	
Ultima 3 (D)	39
SSI	
Battalion Commander (D)	26
Battle Normandy (D)	26
Colonial Conquest (D)	26
Computer Ambush (D)	39
Computer QB (D)	26
Filed of Fire (D)	26
Germany 1985 (D)	39
Imperium Galactum (D)	26
Kampfgruppe (D)	39
Mech Brigade (D)	39
Norway 1985 (D)	23
Phantasie (DO	26
Questron (D)	26
SUBLOGIC	
Flight Simulator 2 (D)	36
TIMEWORKS	
Data Manager 2 (D)	33
Swiftcalc/Sideways (D)	33
Wordwriter/Speller (D)	33

COLORED DISKS AS LOW AS 79¢ EACH
FLOPPY DISKS AS LOW AS 59¢ EACH
Fully guaranteed. Includes sleeves and hub rings.
DISKETTES (2 box minimum) 10 per box

5¼"	BLACK GENERIC BULK		COLORED GENERIC BULK	
BULK	SS/DD	DS/DD	SS/DD	DS/DD
20-69	.74 ea.	.99 ea.	.89 ea.	1.09 ea.
70+	.59 ea.	.85 ea.	.79 ea.	.99 ea.

5¼"	Black Generic	Color. Generic	BASF	Maxell
Boxes (10)	SS/DD	SS/DD	SS/DD	SS/DD
2 - 6	8.90	10.90	10.90	16.90
7+	7.40	9.90	9.90	15.90

To order call **TOLL FREE**
1-800-824-7506
ORDER LINE ONLY

COMPUTER CREATIONS, Inc.
VISA P.O. BOX 493 - DAYTON, OHIO 45459
For information, order inquiries, or for Ohio orders (513) 435-6868

Order Lines Open 9 a.m. to 9 p.m. Mon-Fri.; 10 a.m. to 4 p.m. Sat. (Eastern Standard Time). Minimum $15 per order. C.O.D. (add $3.00). Please specify computer system. Call toll free number to verify prices and availability of product. Prices and availability are subject to change without notice. We ship C.O.D. to Continental U.S. addresses only! Please include 4% shipping on all Hardware orders (min. $4.00). Software and accessories add $3.00 shipping and handling in Continental U.S. Actual freight will be charged outside U.S. to include Canada, Alaska, Hawaii, Puerto Rico and APO. Ohio residents add 6% sales tax. Canadian orders 5% shipping. (Min. $5.00). All other foreign orders, please add 15% shipping. (Min. $10). For immediate delivery send cashier's check, money order or direct bank transfers. Personal and company checks allow 3 weeks to clear. School purchase orders welcome. Due to our low prices, all sales are final. NO CREDITS. All defective returns must have a return authorization number. Please call (513) 435-6868 to obtain an RA# or your return will not be accepted for replacement or repair.

Circle 118 on Reader Service card.

Hats off to a machine language teaching system that works.

Machine language programming isn't easy, but you don't have to be a genius to learn it. Despite what you may think after getting lost in umpteen "How to program the 6502" books. Let your Commodore 64 teach it to you.

The Visible Computer: 6502 is an award-winning blend of text and software that thousands have used to master the elusive skills of machine language.

It's an animated simulation of the 6502 microprocessor that lets you see with your own eyes how the 6502 works. You'll be using it as a debugging tool for years to come.

It's a tutorial. The 150 page manual is more than just instructions on running the simulator — it may just be the best book on machine language ever written.

It's 30 demonstration programs you'll work through with the 6502 simulator, from simple register loads to advanced graphics programs.

The Visible Computer: 6502

Send me The Visible Computer: 6502 for Commodore 64 (requires disk drive). I've enclosed $39.95 plus $2.50 postage and handling.

☐ Check or Money Order ☐ Visa ☐ Mastercard

Name

Address

City/State/Zip

Credit Card No. Exp.

Software Masters™
P.O. Box 3638
Bryan, Texas 77805
(409) 822-9490

Compiled by SUSAN TANONA

Graphics for the Commodore 64 Computer

Jeff Knapp
Prentice-Hall, Inc.
PO Box 819
Englewood Cliffs, NJ 07632
Softcover, 140 pp., $12.95

Graphics for the Commodore 64 Computer is a godsend for programmers who feel it's time to move beyond simple ROM-generated graphics. Author Jeff Knapp will slowly and logically lead you through the steps necessary to create advanced screen displays.

This book supplies the key to unlocking the treasures of the VIC chip, and should allow even less experienced programmers to create high-quality screen displays.

The text advances from keystroke graphics, the easiest to reproduce, to the more advanced multicolor high-resolution graphics (similar to those you might see in advanced arcade games and business programs).

Included in the book is information on how to create your own custom-character set and how to create vertical and horizontal scrolling.

Each chapter is sprinkled with examples and programs to support the text's instructions. The key to learning from this book is not only in reading it, but also in studying the program listings themselves, most of which are relatively short. (You can also purchase a disk that contains these programs.)

All of the listings are in Basic, although there is a short excursion into machine language at the point where Knapp discusses high-resolution graphics.

I found Knapp's writing style a pleasure to read. His instructions are thorough and easy to understand.

Knapp knows how to get the treasure out of the VIC Chip, as well as how to effectively share this knowledge with others. If you are familiar with the workings of the C-64 and have at least a casual knowledge of Basic, you'll be able to take Knapp's instructions and put them to work in your own programs.

The real value of this book is in the examples that it contains. Each chapter builds upon the last and prepares you for the next. Most chapters begin with Direct-mode examples, which are then developed into complete programs.

If you feel comfortable with Basic and would like to explore beyond, *Graphics for the Commodore 64 Computer* was written just for you.

Gary Fields
Asheville, NC

1541 Single Drive Floppy Disk Maintenance Manual; 1541 Maintenance Guide

Michael G. Peltier
Peltier Industries, Inc.
735 N. Doris
Wichita, KS 67212
Manual: Softcover, 190 pp., $29.95
Guide: Softcover, 64 pp., $9.95

These two books fill a huge need—the need for accessible technical information about the Commodore disk drive. These are well-prepared service manuals that can be used by electronics tinkerers and digital engineers alike.

The larger of the two, the maintenance manual, is a complete reference work, including schematics, procedures, parts lists and troubleshooting guides. This should fill the documentation needs of anyone planning to perform some serious work on the 1541.

The maintenance guide is a much-abridged version of the manual and is suitable for any 1541 owner who would like to be able to align or troubleshoot the drive. It contains little information on operating theory, nor does it provide any detailed trouble analysis.

Both books are written in the tradition of a military service manual. They include everything that the technician needs to know in order to service the equipment, including construction details for special cables. The troubleshooting sections are profusely illustrated, with step-by-step instructions for isolating problems in specific systems and subsystems.

Of greatest interest to most disk-drive owners are the instructions on speed calibration and head alignment. Peltier's method of alignment requires only a digital voltmeter and a simple home-made video detector. The alignment standard can be either an inexpensive disk (available from Peltier) or any commercially recorded disk.

These are excellent books, put together in a professional manner that should be emulated by others. Most of us should own the guide, and anyone with interest or training in electronics should own the manual. Both would be valuable additions to your library.

Louis F. Sander
Pittsburgh, PA

Using & Programming the Commodore 64, Including Ready-to-Run Programs

John Herriott
TAB Books, Inc.
Blue Ridge Summit, PA 17214
Softcover, 147 pp., $9.95

Using & Programming the Commodore 64, Including Ready-to-Run Programs is a short book with a long title that will do for new C-64 owners what aspirin does for a headache. When author John Herriott wrote this book, he kept the novice's needs in mind, as it is both easy to read and understand.

This book should remove the fear of computers from even the least experienced user. Although not a complete guide to the power of the C-64, it presents information that should fill some of the gaps left by the *Commodore 64 User's Guide*, and will prepare you for the challenge of the *Commodore 64 Programmer's Reference Guide*.

Herriott assumes that the reader is a new computer owner and begins by explaining the components of the computer and how to set up your system. Then he discusses the keyboard, special keys and how to get in and out of Direct mode.

The book's program listings do not contain Commodore graphics symbols, which is a definite advantage. Instead, the listings use CHR$ commands, which cannot be confused with anything else. This makes debugging a listing much easier to accomplish.

Each chapter is self-complete and ends with a capsule review. I found these summaries to be very helpful when I was looking for information to restudy.

Most of the subjects that new owners will need to know about are covered or at least touched upon in the book, such as sound, sprites, printer controls, using the disk drive, joystick controls and the VIC Modem.

Appendix C includes conversion commands that translate other versions of Basic to Commodore Basic. For example, you may be able to convert a listing from Apple to Commodore Basic by using the information found here.

Appendix E is a glossary of error messages that defines each one and gives probable causes and solutions.

Herriott includes two very useful listings—a small database and a word processing program. These offer the new C-64 owner some workable software for simply the cost of the book.

Using & Programming the Commodore 64, Including Ready-to-Run Programs is an outstanding value. It is among the least expensive of computer books available, and I'd recommend it for anyone who is new to Commodore computing.

Gary Fields
Asheville, NC

New Releases

Einstein's Beginners' Guide to the Commodore 64

Jeff Einstein (Harcourt Brace Jovanovich, 1250 Sixth Ave., San Diego, CA 92101. Softcover, 184 pp., $7.95.) This introductory guide discusses many of the C-64's general features, including start-up, understanding memory, file management, graphics and sound.

Computer Workout

Jim Keogh and Software Lab East (Hayden Book Co., 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Softcover, 64 pp., $2.95.) Written for ages seven and older, this book introduces children to technical terms and basic computer operations, through the use of crossword puzzles and word-search games.

Commodore 16 User's Manual

(Howard W. Sams & Co., Inc., 4300 W. 62nd St., Indianapolis, IN 46268. Softcover, 224 pp., $12.95.) Familiarizes new and intermediate users with the fundamental structure of a program and introduces the C-16's Basic 3.5 as an aid in producing simple graphics, creating music and working with numbers.

Learning Commodore 64 Basic

David A. Lien (CompuSoft Publishing, 535 Broadway, El Cajon, CA 92021. Softcover, 346 pp., $14.95.) A step-by-step guide to programming the C-64. This book provides hands-on experience, with samples and exercises to perform. A summary is provided at the end of each chapter.

Commodore 64 Micro Mansion: Using Your Computer to Have a Safer, More Convenient Home

David Bonynge (TAB Books, Inc., Blue Ridge Summit, PA 17214. Softcover, 192 pp., $11.45.) An introduction to using the C-64 as a home-control device. Discussions include how to control such activities as air conditioning, burglar and fire alarms, and appliances.

HARDWARE GALLERY

Compiled by SUSAN TANONA

Reset Master

A Handy Peripheral That's a Sure Cure For Computer Lockup

It has happened to all of us at one time or another. You're trying to debug a program when, suddenly, the keyboard locks up. Pressing the run/stop and restore keys has no effect. At this point, a reset switch that would unlock the keyboard and retrieve the program would certainly come in handy.

You could build your own reset switch by soldering a rat's nest of wires and hardware to your computer. But such projects are notorious for causing the ROM and RAM components in the computer to gradually melt down.

There are a few reset switches commercially available that you can use with Commodore computers, but you probably won't find one more simple in design and function than the Reset Master.

Reset Master consists of a small, blue plastic box with a spring-loaded button on top. A two-foot serial cable, with a standard six-pin connector, is permanently connected to one side of the switch, and two serial ports are on the front of the switch. Fortunately, you don't have to solder or open the computer to install the unit.

Documentation is made up of a four-page manual and four short Basic Renew programs. These programs consist of four separate listings: one for the C-64 and SX-64; one for the unexpanded VIC; one for the 3K expanded VIC; and another for a VIC with 8K or more expansion.

After you've loaded and run the Renew program, pressing the reset switch will cause the computer to emulate a cold start, complete with the introductory screen. Then, if you enter the SYS command that appeared when the Renew program was executed, any program that resided in memory when the reset switch was pressed will be retrieved.

The two user ports on the reset switch give you a lot of options if you have more than one printer. The manual states that you can connect two printers to the reset switch, but a little experimentation will reveal that you can actually connect two serial printers or one parallel and one serial printer.

The manual gives three examples of wiring configurations for connecting the reset switch between peripherals, or between the computer and peripherals. All these configurations, as well as variations upon these configurations, work; but be forewarned that some of the latest serial hardware may not work properly with certain cable arrangements. I encountered a problem connecting the switch between an Indus GT disk drive and a Star SG-10C serial printer. However, none of the components involved were any worse for wear, and I seriously doubt that any other cable configuration would duplicate the problem.

You may be wondering how this device could work on an early model VIC and a late model C-64, as well as on every model of the VIC and C-64 in between. A rudimentary, but effective, countermeasure was taken by the manufacturer to ensure that Reset Master would be compatible with all VICs and C-64s. The company simply installed two small Phillips-head screws on one side of the switch's casing. Beneath one of the screws is a staple that you can easily adjust, should the switch not work with your computer. The entire procedure is clearly described, with accompanying illustrations, in the user's manual.

What you may find to be one of the most useful features of Reset Master is the two extra feet of serial cable that it provides. Overall, the ease of installation and use of Reset Master make it one of the best hardware investments available for your computer. *(Master Software, 6 Hillery Court, Randallstown, MD 21133. C-64, VIC-20/ $24.95.)*

Tim Walsh
***RUN* staff**

G-Wiz

A Full-Featured and Versatile Printer Interface For Your Commodore 64

Cardco, one of the key manufacturers of peripherals for the Commodore 64, and the maker of the + G printer interface, has introduced the G-Wiz, an expanded-function printer interface for the C-64. The G-Wiz offers all the features and functions of Cardco's + G interface, plus some additional features.

The G-Wiz has one set of eight DIP switches to control the interface functions. These switches are accessible from outside the circuit case, so you'll no longer have to take the case apart to make changes to the interface setup. (This was a prime annoyance with previous Cardco units.)

Features of the G-Wiz include: alphanumeric and full Commodore

Circle 208 on Reader Service card.

New!

Now You Can Add

ARTIFICIAL INTELLIGENCE

To Your Programs Using a Powerful Combination

"SUPERFORTH 64" +AI

"A professional system thats **easy** for anyone to use"

Easy Programming with English Language Words

By Elliot Schneider & Jack Park

Here's Your Chance to Profit by being on the Forefront, Write 5th Generation Software

AI Module
- Create Intelligent Programs
- Build Expert Systems
- Write Stand Alone License Free Programs
- Construct Rule Bases
- Do Knowledge Engineering
- Use Inference Engines

Write Intelligent Programs For:
- Home Use
- Robotics
- Medical Diagnosis
- Education
- Intelligent CAI
- Scientific Analysis
- Data Acquisition
- Data Analysis
- Business
- Real Time Process Control
- Fast Games
- Graphics
- Financial Decisions

Extended Math Module
- Fast ML Floating Point & Integer Math
- Double Precision 2E±38 with Auto. Sci Not.
- n*e* Logx Loge Sin Cos Tan SQR 1/X...
- Matrix and Multidimensional Lattice Math
- Algebraic Expression Evaluator

SUPERFORTH 64
- Interactive Interpreter
- Forth Virtual Memory
- Full Cursor Screen Editor
- Full String Handling
- Trace & Decompiler
- Conditional Macro Assembler
- 1/6 the Programming Time
- Interactive Compiler
- Romable Code Generator
- 40K User Memory
- All Commodore File Types
- Conversational User Defined Commands
- 10 to 600x Faster than Basic

Graphics I/O Module
- Hires Plotting
- Split Screen
- Printer/Plotter Ctrl
- Sprite Editor
- Turtle Graphics
- Koala Pad Graphics Integrator
- Hires Circle, Line, Arc
- Music Editor
- Sound Control

Easy Control of all I/O...
- RS232 Functions
- Access all C-64 Peripherals
- Interrupt Routines

SuperForth 64 is more powerful than most other computer languages
LANGUAGES
SUPERFORTH 64+AI
LISP
PROMAL
C
PASCAL
BASIC
FORTRAN
ASSEMBLER
POWER OF LANGUAGES CONSTRUCTS

Great Documentation
- Easy to Read 350 pg. Manual with Tutorials
- Source Screen Provided
- Meets all MVP Forth-79 Industrial Standards
- Personal User Support

A Total Integrated Package for the Commodore 64

SF 64	$59
AI Module	$39
Extended Math Module	$39
Graphics I/O Module	$29
Package Price Only	**$99**

SPECIAL OFFER
All for only $99⁰⁰
(Disk & Manual)
• $3⁰⁰ Ship U.S.A. • $2⁰⁰ C.O.D. U.S.A. • $15⁰⁰ EUROPE

VISA AMERICAN EXPRESS

See Your Local Computer Store
or CALL TOLL FREE
(800) 633-6335
IN CALIF. CALL
(415) 651-3160
PARSEC RESEARCH
Box 1766 Fremont, CA 94538
Dealer Inquiries Invited

Commodore 64 TM of Commodore · Parsec Research PARSEC RESEARCH 41805 ALBRAE ST. FREMONT, CA 94538

Circle 110 on Reader Service card.

kyan

PASCAL

For the Commodore 64

kyan pascal is the most complete package available for learning and using the Pascal language.

kyan pascal is easy to use, lightning fast, and loaded with features. It's a full Pascal implementation. It compiles and runs many times faster than other Pascal compilers.

kyan pascal features:
- Optimized Machine Code Compiler;
- Built-In Full Screen Text Editor;
- String-Handling, Chaining, Include File, and Other Powerful Extensions;
- Random Access Files and Graphics Support;
- Built-In Assembler (Allows Full Hardware Control);
- 13-Digit Arithmetic Precision; and,
- Tutorial Manual with Sample Programs.

kyan pascal requires 64K of memory and a single disk drive. No additional hardware is necessary. And, it comes with kyan's MONEY BACK GUARANTEE... **If not completely satisfied, return it within 15 days for a full refund.**

kyan pascal for the C64 .... $69.95
(Add $4.50/copy for handling; $12.00 outside North America; California residents add $4.55/copy for sales tax)

Send Check/Money Order to:
Call: (415) 626-2080
MC/Visa Accepted

kyan software, Dept. F
1850 Union St., Ste. 183
San Francisco, CA 94123

Circle 125 on Reader Service card.

MODEMS FOR COMMODORE®, ATARI®, APPLE® & IBM®

For COMMODORE® Use

For ATARI® Use

For APPLE® & IBM® Use

TH002 300BPS/BELL 103
Retail $35.00

TH003 300BPS/BELL 103
Retail $39.95

TH024 2400/1200/300BPS HAYES® COMPATIBLE
Retail $440.00

TH012C 1200/300BPS, BELL 212A/103
Retail $175.00

TH012D 1200/300BPS, BELL 212A/103
Retail $175.00

TH012A/B 1200/300BPS, BELL 212A/103 HAYES® COMPATIBLE
Retail $195.00

For Retail & Dealer Price, Please Contact Following Reps

U.S.A.

A.C. ELECTRONIC
(805) 9687272 CA

ACS COMMERCIAL INC.
(213) 6963187 CA

PM SALE
(206) 9358519 WA

J. LEFEBURE & ASSOCIATES
(713) 7717728 TX

CODOM INC.
(305) 9871122 FL

CANADA

RAITRONIC
(604) 8750207
VANCOUVER

PHASE 4
(403) 2520911
ALBERTA

M&M SALES
(514) 7386580
MONTREAL

For OEM & Importer Price, Please Contact

TAIWAN HWAN HONG ENTERPRISE CO.
P.O. BOX: 18-48 PANCHIAO, TAIPEI HSIEN, TAIWAN, R.O.C.
ADDRESS: 6TH FL., NO. 163, HAN-SHENG E. ROAD, PANCHIAO, TAIPEI HSIEN, TAIWAN, R.O.C.
TELEX: 31228 TAIHAHO
CABLE: TAIHAHO
TEL: (02) 959-1166 (5 LINE)

Circle 140 on Reader Service card.

USE AISLE 12
4 DRIVE UNITS OR LESS
PREPAY ONLY
PAY FOR 5 ALIGNMENTS GET 6TH ONE FREE
NO CREDIT ON SERVICE WORK
NO MACHINE WITHOUT THE GREEN
NOT RESPONSIBLE FOR MISSING FLIPPIES
BE POLITE
EVERYONE HAS TO WAIT
TAKE NUMBER
NOW SERVING
$150.00 DEPOSIT EACH DRIVE UNIT
SAVE YOUR RECEIPTS
FREE VACUUM CLEANER WITH 200TH ALIGNMENT

Who needs this?

When you can solve disk drive alignment problems in 60 minutes with the CSM program.

Disk drive alignment problems?
Drive out of alignment again?
Tired of waiting two weeks or more to get your drive fixed??

WE HAVE THE ANSWER ! !

With the 1541 DISK DRIVE ALIGNMENT PROGRAM you can align the drive yourself in an hour or so. Not only that, you can do it at home AND no special equipment is required. Anyone with average mechanical skills can do it! !

Read What Compute!'s Gazette had to say. (Oct., 1984)

". . . with 1541 Disk Drive Alignment *from CSM Software, you can fix it* [the disk drive] *yourself in an hour or so and the program will pay for itself the first time you use it...No technical expertise is required to accomplish the alignment procedures, and the manual accompanying the program thoroughly describes the procedures."*

1541 DISK DRIVE ALIGNMENT PROGRAM - VERSION 2.0 - *$44.95 plus shipping*

CARTRIDGE BACKER

PACKAGE INCLUDES:

1. EXPANSION BOARD, PROGRAM DISK AND USER'S MANUAL
2. CARTRIDGE BACKER software to back-up 99% of the most popular C-64 cartridges to disk.
3. SOFTWARE TO BACK UP MANY DISK PROGRAMS.
4. SOLD FOR ARCHIVAL USE ONLY!!

$54.95 plus shipping

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME II

Not just a third edition — a new and up-to-date manual covering the latest advances in program protection. Over 275 pages of valuable information. Topics include:

- *ENCRYPTION AND DECRYPTION*
- *UNDOCUMENTED OPCODES*
- *GCR RECORDING*
- *CUSTOM DOS ROUTINES*
- *CARTRIDGES AND EPROMS*
- *PROTECTING YOUR OWN SOFTWARE*
- *TIPS FROM EXPERTS ON PROTECTION, BACKUP & MORE*
- *DISK INCLUDED*

$34.95 plus shipping

NEW PRODUCT

★ SNAPSHOT 64™ ★

SNAPSHOT 64 is a new utility backup program that literally takes a 'SNAPSHOT' of your computer's memory. This snapshot is then saved to disk with an autoboot so that it may be easily loaded back in. It does all this automatically and easily.

- *EASY TO USE. TAKES ONLY 3-5 MINUTES*
- *BACKS UP MANY MORE PROGRAMS THAN SIMILAR UTILITIES*
- *SOLD FOR ARCHIVAL PURPOSES ONLY*
- *EXCLUSIVE FEATURE - ALLOWS YOU TO STOP MOST PROGRAMS AT ANY POINT, EXAMINE THE COMPUTER'S MEMORY, AND THEN RESTART THE PROGRAM. THIS IS A VERY VALUABLE FEATURE FOR THE HACKER!!*

$49.95 plus shipping

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME I

- *A MUST FOR BEGINNERS*
- *THE PERFECT INTRODUCTION TO PROGRAM PROTECTION*
- *DISK INCLUDED*

$29.95 plus shipping

VISA AND MASTERCARD ACCEPTED
Shipping $3.50 per item in U.S.; foreign orders extra

C= is a registered trademark of Commodore Business Machines, Inc.

Available through your local software dealer or call:
CSM SOFTWARE, INC.
POST OFFICE BOX 563, CROWN POINT IN. 46307, PHONE (219) 663-4335

graphics printing; a Transparent mode, which sends characters directly to the printer; a Lock mode, which prevents a program's secondary address commands from making unwanted changes to the interface setup; and a Hexadecimal mode, which prints all characters as their hexadecimal equivalents. This is useful in program debugging.

The DIP switch settings on the G-Wiz can be read and changed with software commands. This allows you to monitor the setup of the interface in a program and alter the settings for different printout options. This feature allows you to address all interface functions through software.

Cardco has also incorporated what they call a high-resolution screen dump buffer. This buffer speeds up hi-res graphics screen dumps by as much as 18 times.

The G-Wiz also includes two character sets, so you can adjust the size of graphics characters.

My review copy of the G-Wiz interface was a beta test unit that came without a plastic case over the circuit board and without the finished user's manual. My instructions consisted of a +G manual and a 12-page insert that described the differences between the +G and the G-Wiz. Therefore, I really can't make a complete assessment of the package's documentation. However, if Cardco's documentation for its other products is any indication, I'm sure the manual for the G-Wiz will be excellent and well above the industry norm.

And now, for the best news: The G-Wiz costs about one-third less than the +G. And, if you own one of Cardco's other interfaces and are interested in upgrading to the G-Wiz, Cardco is offering a trade-in deal: In exchange for a +G, you can buy a G-Wiz for $35; and in exchange for an A or B interface, you can have the G-Wiz for $40.

The Cardco G-Wiz parallel printer interface is one of the best and, feature for feature, least expensive printer interfaces available today. *(Cardco, 300 S. Topeka, Wichita, KS 67202. C-64/$69.95.)*

James Steffen
Germantown, TN

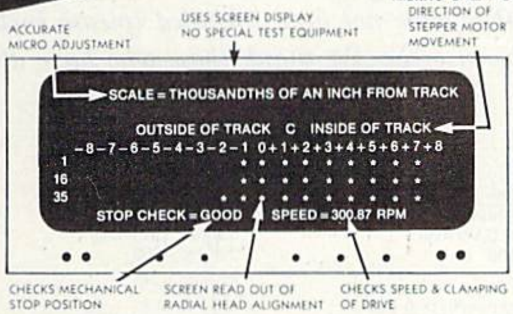
Circle 192 on Reader Service card.

1541
PHYSICAL EXAM

N
E
W

1571 PHYSICAL EXAM
4040 PHYSICAL EXAM
8050 PHYSICAL EXAM
8250 PHYSICAL EXAM

SEE REVIEWS IN:
RUN. 6/85 P. 14
AHOY. 4/85 P. 32
MIDNITE GAZ. #23 P. 78


ACCURATE MICRO ADJUSTMENT
USES SCREEN DISPLAY NO SPECIAL TEST EQUIPMENT
DIRECTION OF STEPPER MOTOR MOVEMENT
SCALE = THOUSANDTHS OF AN INCH FROM TRACK
OUTSIDE OF TRACK C INSIDE OF TRACK
-8-7-6-5-4-3-2-1 0+1+2+3+4+5+6+7+8
1
16
35
STOP CHECK = GOOD
SPEED = 300.87 RPM
CHECKS MECHANICAL STOP POSITION
SCREEN READ OUT OF RADIAL HEAD ALIGNMENT
CHECKS SPEED & CLAMPING OF DRIVE

PACKAGE INCLUDES:
- TRUE DIGITAL ALIGNMENT DISK WITH OFFSET TRACKS
- QUIET DRIVE STOPS TO REDUCE THE NEED FOR CONTINUED REALIGNMENT ON ALPS AND NEUTRONICS DRIVES.

PHYSICAL EXAM $39.95 (EACH)
EXTRA STOPS $ 4.95 (EACH) + SHIP.
PLEASE SPECIFY WHICH DRIVE.

800
762-5645

CARDINAL SOFTWARE
13646 JEFF DAVIS HWY., WOODBRIDGE, VA 22191
INFO CALL: (703) 491-6502
IN CANADA: APPIN MICRO 1283 PHARMACY AVE.
SCARBOROUGH, ONTARIO M1R 2J1 (416) 443-0843

ULTRABYTE
DISK NIBBLER
VERSION 2.0

TOP - RATED COPIER
DRAMATICALLY IMPROVED

INFO - 64 Magazine, June 1985, compared Commodore 64 copy programs and awarded the Nibbler its highest rating. Now the Nibbler has been improved to copy dozens of the latest programs that previously could not be copied, all in less than three minutes.

FOR SINGLE 1541 & DUAL MSD DRIVE

- Simple. Even a beginner makes perfect copies
- Fast. Copies protected disks in three minutes
- Sophisticated. Senses the disk being copied and automatically adjusts for dozens of protection schemes. Copies 99 + % of software
- Modular design to allow easy updates
- Even copies itself. For this reason, no refunds will be given

$ 39.95 plus $ 4.00 shipping & handling.

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($2.60) sales tax.
Foreign orders or COD add $2.00. Payment must be in U.S. funds.
Previous customers may order V 2.0 for $20.00 plus $4.00 shipping

NIBBLER V 2.0 EVEN COPIES ITSELF

To order, write or call 24 hr. order line
For information, write. Phone for orders only
ULTRABYTE (818) 796 - 0576
P.O. Box 789 La Canada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

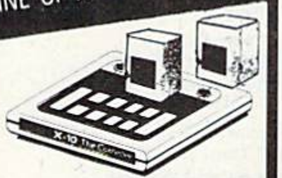
Circle 195 on Reader Service card.

FREE HOME OF THE FUTURE DESIGN KIT

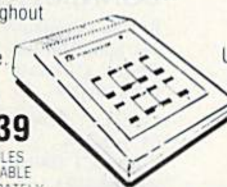
Step-by-step guide to integrating futuristic convenience, security and energy savings into your home today. Only SmartHome Shopper brings you the latest in quality home control technology.

X-10

NOW AVAILABLE
FULL LINE OF X-10 PRODUCTS


X-10 The Controller

POWERHOUSE
Use with your home computer to control and program up to 256 lights, appliances and other electrical devices throughout your home.



ONLY
$139
MODULES AVAILABLE SEPARATELY

STARTER KIT
Controller with 2 modules
Uses existing house wiring to instantly control up to 8 lights and appliances with the push of a button. Easy to operate, fully compatible and expandable.

SPECIAL OFFER $48

(408) 559-3788

AVAILABLE FROM
SMART HOME
SHOPPER
274 E. Hamilton Avenue ■ Campbell, CA 95008

Circle 223 on Reader Service card.

MONITORS DISK DRIVES

$149
FULL
COLOR
COMMODORE 1702

$159
1541
COMMODORE

VIDEO

COLOR
VIDEO CAMERA
& RECORDER
$698

PORTABLE
VIDEO RECORDER
$198

1-800-328-8322 EXT 581

T & D ELECTRONICS
10517 UPTON CIRCLE
BLOOMINGTON, MN 55431

Commodore Service Network Updates

The following update list of Commodore service centers includes two categories: 1) corrections to the list published in the July, August and September issues, and, 2) centers that have been authorized by Commodore since our original list was printed. RUN *will continue to update the list periodically, but cannot undertake to identify former centers that are either out of business or no longer affiliated with Commodore.*

We again urge authorized service centers to notify us if they have not been included (please enclose a copy of the authorization letter) or if our listing is seen to be in error. We thank those who have already done so.

ALABAMA

Computer Shoppe
207 Lochmann's Village
Birmingham, AL 35244
205-988-0003

Computer Shoppe
700 Parklane N.
Jasper, AL 35501
205-221-5210

Hytek Computer Services
7110 Jones Valley Drive
Huntsville, AL 35802
205-881-6342

Model City Electronics
4125 Saks Road
Anniston, AL 36201
205-238-1871

Winter Electronic
420 15th St.
Tuscaloosa, AL 35401
205-752-7176

ALASKA

Byte Enterprises
4543 Glacier Spur Road
Juneau, AK 99801
907-780-5153

ARIZONA

Copperstate Cash Register
3125 E. McDowell Road
Phoenix, AZ 85008
602-244-9391

RCA Service Co.
4415 S. 32nd St.
Phoenix, AZ 85040
602-243-3011

Strauchs' Stationers
12 W. Main St.
Mesa, AZ 85201
602-834-4686

ARKANSAS

JJ's Television & Electronics
2007 Southwest A St.
Bentonville, AR 72712
501-273-5880

Lively Electronics
619 N. Hervey
Hope, AR 71801
501-777-1316

Vidcom Center
936 State Line Ave.
Texarkana, AR 75502
501-772-6277

CALIFORNIA

Albany Microcomputer Service
1494 Soland Ave., Suite #4
Albany, CA 94706
415-527-9619

Associated Electronic Service
2059 West Lincoln St.
Oroville, CA 95965
916-533-9021

Cav Electronics
1018 S. Pacific Coast Highway
Redondo Beach, CA 90277
213-316-3841

Century Computer
1040 E. Whittier Blvd. Suite 102
La Habra, CA 90631
213-697-6977

Compucare
1817 4th St., #5
San Rafael, CA 94901
415-459-6461

Computer Time
8040D Greenback Lane
Citrus Heights, CA 95610
916-969-4111

Computer & Peripheral
294 Capital Ave.
San Jose, CA 95127
408-272-4028

Computer Outlet
5861 Mission Gorge Road
San Diego, CA 92120
619-282-6200

Computer Repair & Maintenance
1668 Callens Road
Ventura, CA 93003
805-656-2726

Computers & Copies
22521 Second St.
Haywood, CA 94541
415-537-1323

Comstar
5386 Hollister Ave.
Santa Barbara, CA 93111
805-964-4660

CRC Computer Repair
1991-J Santa Rita Road
Pleasanton, CA 94566
415-846-4812

CSB, Inc.
10225 Barnes Canyon Road
San Diego, CA 92121
619-455-6114

Des Computer Repair
13908-B Ventura Blvd.
Sherman Oaks, CA 91423
818-788-4417

DuWayne Industries
1100-B Pleasant Valley Drive
Pleasant Hill, CA 94523
415-932-4373

Eastside Electronics
922 Soquel Ave.
Santa Cruz, CA 95062
408-423-6515

HT Electronics
346 West Maude Ave.
Sunnyvale, CA 94086
408-737-0900

I'ro Inc.
1287 Lawrence Station Road
Sunnyvale, CA 94089
408-745-1110

Ken's Computer
25856 Muirlands Blvd.
Mission Viejo, CA 92691
714-472-0965

Masons TV & Computers
7347 Church St.
Yucca Valley, CA 92284
619-365-2440

Micro Comtech
23035 Ventura Blvd.
Woodland Hills, CA 91364
818-704-4757

Microcomputer Service Network
3849 Peralta Blvd. Suite A
Fremont, CA 94536
415-797-4724

Microsys Trouble Shooters
3014 Shattuck Ave.
Berkeley, CA 94705
415-540-5435

On-Line Computer Repair
3207 S. Brea Canyon Road
Diamond Bar, CA 91765
714-594-2641

Software First
1211-A North Dutton
Santa Rosa, CA 95401
707-576-0972

Sommer's Electronics
147 Third St.
San Rafael, CA 94901
415-459-3135

Star Computers
655 Morro Bay Blvd.
Morro Bay, CA 93442
805-772-7827

Sunrise Electronics
10439 Los Alamitos Blvd.
Los Alamitos, CA 90720
213-598-9525

System Users Network
160 Walnut Lane
Santa Barbara, CA 93111
805-967-5345

Tad Electronics
45117 N. 13th St. W.
Lancaster, CA 93534
619-373-2270

Technitronics
1830 Fremont Ave.
South Pasadena, CA 91030
818-441-0103

The Computer Room
3391 Mono Way
Sonora, CA 95370
209-532-8895

Commotech
1636 D Ave.
National City, CA 92050
619-477-3106

Trentacosta Service
10304 Rosecrans Ave.
Bellflower, CA 90706
213-925-6080

Vic's TV & Computer Service
1002 Placer St.
Redding, CA 96001
916-243-4531

Western Instrument Lab
4608 Margalo Ave.
Bakersfield, CA 93309
805-834-2134

COLORADO

Advanced Computer Service
356 East 4th St.
Loveland, CO 80537
303-663-0172

Dean's Electronics Service
290 Christenson
Granby, CO 80446
303-887-2744

House of TV Repair
2648 S. Parker Road
Aurora, CO 80014
303-696-7657

Micro World Electronix
3333 S. Wadsworth Blvd.
Lakewood, CO 80227
303-987-9531

CONNECTICUT

Beacon Computers
441 Long Hill Road
Groton, CT 06340
203-445-0023

Computer Development Systems
63 North St.
Bristol, CT 06010
203-583-5993

Computer Doctor
260 Hathaway Drive
Stratford, CT 06497
203-377-4500

Electronics Service Corp.
501 Post Road East
Westport, CT 06880
203-227-7291

JRB Enterprises
31 Main St.
Danielson, CT 06239
203-774-0291

JRB Enterprises
Rte. 32
North Franklin, CT 06254
203-642-7750

JRB Enterprises
29 Franklin St.
Norwich, CT 06360
203-886-5880

Multi-Business Computer Systems
28 Marlborough St.
Portland, CT 06480
203-342-2747

New England Hobby Supply
71 Hillard St.
Manchester, CT 06040
203-646-0610

Sascoa Electronic Service Corp.
501 Post Road E.
Westport, CT 06880
203-227-7291

The Video Connection
3851 Main St.
Bridgeport, CT 06606
203-372-6717

The Video Connection
Commerce Plaza
Danbury/Newtown Road
Danbury, CT 06810
203-797-1940

The Video Connection
Corbin's Corner Shopping Center
West Hartford, CT 06110
203-521-2084

DELAWARE

Audio Video Computer World
169 East Main St.
Newark, DE 19711
302-737-7547

Products Plus
1274 S. Governor's Ave.
Dover, DE 19901
302-734-1519

FLORIDA

A-1 Computer Service Center
2033 Harrison St.
Hollywood, FL 33020
305-923-5115

B & G Electronics
3133 Fletcher Ave.
Eaton Park, FL 33840
813-665-8297

Commodore Computer Shop
2142 E. Silver Springs Blvd.
Ocala, FL 32670
904-351-8581

Computech
100 Sand Dunes Drive
Ormond Beach, FL 32074
904-445-4737

Computer Bar
3300 N. Pace Blvd.
Pensacola, FL 32505
904-438-4118

Computer Base
3337 S. Westshore Blvd.
Tampa, FL 33629
813-831-4763

Computer Center
7143 North 9th Ave.
Pensacola, FL 32504
904-478-6558

Computer Image
10061 Sunset Drive
Miami, FL 33173
305-271-1255

Computer Trends
6806 Ridge Road
Port Richey, FL 33568
813-847-4914

Electronic City
233 Interlake Blvd.
Lake Placid, FL 33852
813-465-4372

Electronics Depot
301 E. Altamonte Drive
Altamonte Springs, FL 32701
305-834-1155

Family Computer Center
1711 N. Pine St.
Ocala, FL 32670
904-622-9090

Florida Book Store
1614 West University Ave.
Gainesville, FL 32604
904-376-5606

La Peres Computer Clinic
Rt. 5, Box 35A, Bain Road
Ft. Meyers, FL 33908
813-482-6077

Lathams TV
501 S. Main St.
Crestview, FL 32536
904-682-2309

Miami Appliance
18755 West Dixie Highway
N. Miami Beach, FL 33180
305-931-6066

Microcomputer Center
1475 South Belcher Road
Clearwater, FL 33546
813-531-2614

National Business Machines
231 S. Florida Ave., Box 1390
Deland, FL 32721
904-736-1122

New Age Electronics
1838-36 14th St. W.
Bradenton, FL 33505
813-746-5997

New Age Electronics
2198 Coachman Road NE
Clearwater, FL 33575
813-447-2369

Orlando Computer Center
5625 S. Orange Blossom Trail
Orlando, FL 32809
305-855-1010

Rainbow Computer Center
4921 E. Colonial Drive
Orlando, FL 32803
305-894-2270

Random Access Computers
296 N. Elgin Parkway
Ft. Walton Beach, FL 32548
904-837-7201

Software Station
5810 North University Drive
Tamarac, FL 33319
305-726-4393

SOS Computer
13850 Walsingham Road
Largo, FL 33544
813-581-3040

GEORGIA

Acom Corp.
3482 Oakcliff
Doraville, GA 30340
404-451-8455

American Computer Maintenance
416 12th St.
Columbus, GA 31902
404-327-4844

American Computer Maintenance
3145-J Gateway Drive
Norcross, GA 30092
404-446-0791

Athens Microcomputers
2173 W. Broad St.
Athens, GA 30606
404-549-0337

Cardinal Computers
903 N. Glenwood Ave.
Dalton, GA 30720
404-226-0502

Computer Command
Brookwood Plaza
Valdosta, GA 31601
912-244-2108

Georgia Service Center
595 Roswell St.
Marietta, GA 30060
404-426-1310

Harris TV
1 East Montgomery Cross Road
Savannah, GA 31406
912-927-2084

Home Computer Shop
3224 Wrightsboro Road
Augusta, GA 30909
404-737-8144

Software South
4 Mall Terrace
Savannah, GA 31406
912-352-3950

HAWAII

J & C Repair
94–281 Kahuanani Place
Waipahu, HI 96797
808-671-8652

Otsuka Sales/Service
1620 Kuhio Highway, Box 1180
Kapaa, HI 96746
808-822-7766

IDAHO

ABI Video
1732 West State
Boise, ID 83702
208-465-7515

Digital Doohickeys
1725 W. Broadway
Idaho Falls, ID 83402
208-529-5830

North Electronics
82 Mountain Drive
Pocatello, ID 83204
208-233-8129

ILLINOIS

B–A Business Computers
150 Houston St.
Batavia, IL 60510
312-879-2350

Central Service Co.
11714 South Western Ave.
Chicago, IL 60643
312-338-6000

Central Service Co.
1225 East Golf Road
Schaumburg, IL 60195
312-338-6000

Electronic Service Center
124 S. Illinois
Carbondale, IL 62901
618-457-2598

K's Merchandise Mart
3103 North Charles
Decatur, IL 62526
217-875-1440

KNW Radio & Television
1011 E. 162nd St.
South Holland, IL 60473
312-331-1214

Magnetronics, Inc.
525 Grand View Road
Round Lake Park, IL 60073
312-546-3520

Personal Computer Repair
28 Parliament Drive West
Palos Heights, IL 60463
312-448-2775

Circle 345 on Reader Service card

IT'S LIKE
FREE DISKETTES

U.S. PAT. 4,488,358

Your 5¼" single side disks are usable on the other side. You paid for one side, why not use the other… **IT'S FREE!**

Nibble Notch will **open** your **new** disk. It's easy… won't harm existing data. Try it!

nibble notch I for Apple, Franklin, Commodore & Atari (w/Atari Drives) square notch.

ONLY $14.95* PLUS P&H

ALSO **DISK SURGEON**

Software for C-64 & 1541 Drive
- Read data from, edit & write to disk
- Analyze disk errors without "hammering"
- Read data under errors, erase errors
- Format a single track with any ID
- File copy to copy portions of a disk
- Single track copy • 4 minute copy of entire disk, and much more

FREE Nibble Notch
Buy the Disk Surgeon, get Nibble Notch 1 Free! A $45 value.
$29.95* FOR BOTH! PLUS P&H

QUALITY DISKETTES low as **99¢**

*Add $2
($5 foreign) for
postage & handling.
FL residents
add 5% sales tax.

VISA
MasterCard

TOLL FREE 1-800-642-2536
FL (305)748-3770
or send check
or money order to:

nibble notch®
computer products

4211 NW 75th Terrace • Dept. 165 • Lauderhill, FL 33319

Micro-Pace
1510 N. Neil St.
Champaign, IL 61820
217-356-1883

Servitech
1409 Centre Circle Drive
Downers Grove, IL 60515
312-620-8750

Skokie TV Service Co.
400 West Dundee Road
Buffalo Grove, IL 60090
312-537-6666

Skokie TV Service Co.
9713 Southwest Highway
Oak Lawn, IL 60453
312-636-6661

Software Plus Corp.
731 W. Dundee
Wheeling, IL 60090
312-520-1717

The Unique Computer Shop
1411 East 4th St.
Sterling, IL 61081
815-625-5018

Warren Radio Co.
800 SW Jefferson St.
Peoria, IL 61605
309-674-5998

INDIANA

Computer Corner
6722 E. State Blvd.
Fort Wayne, IN 46815
219-493-6505

Computer Maintenance
7849 Taft St.
Merrillville, IN 46410
219-769-6131

Computer People
900 Highway 212
Michigan City, IN 46360
219-879-8557

Computer Statement
2655 S. Main St.
Elkhart, IN 46514
219-295-0197

Custom Electronics Service
1520 Mishawaka Ave.
South Bend, IN 46615
219-287-4453

Delta I Management Service
401 Howe Road
Porter, IN 46304
219-926-3619

JAM Computers
1920 E. Morgan Ave.
Evansville, IN 47713
812-473-9526

Jim Douglas Martin
1087 Brookdale Drive
New Haven, IN 46774
219-493-6492

MicroWorld Computers
108 East Main St.
North Manchester, IN 46962
219-982-7219

MicroWorld Computers
52 S. Broadway
Peru, IN 46970
317-473-5709

RCA Service Co.
1551 E. 89th Ave.
Merrillville, IN 46410
219-769-1264

Spectrum Sound
3533 West 30th St.
Indianapolis, IN 46222
317-923-7868

IOWA

Computer Doctors
1476 Central Ave.
Dubuque, IA 52001
319-582-9331

EMC
1630 State St., Suite 4
Bettendorf, IA 52722
319-355-7114

Gronert Computers
4505 Forest Ave.
Des Moines, IA 50311
515-255-0618

KANSAS

Camera One
4103 N. Halstead
Hutchinson, KS 67502
316-665-6592

Computer Connection
215 West Cloud
Salina, KS 67401
913-825-2096

Computer Gin
2600 Central Mini Mall
Dodge City, KS 67801
316-225-2628

D & D Service
6213 N. Tyler Road
Wichita, KS 67205
316-722-6742

Data Bank Corp.
4800 W. Maple, Suite 110
Wichita, KS 67209
316-942-0225

Midwest Computer Systems
503 North Washington
Junction City, KS 66441
913-238-1100

Thoroughbred Computers
11 E. 6th Ave.
Emporia, KS 66801
316-342-0221

KENTUCKY

Business Equipment Distributors
817 Mill St.
Henderson, KY 42420
802-827-9500

Woidich Appliance Service
2221 Crittenden Drive
Louisville, KY 40217
502-637-8440

LOUISIANA

Bossier Computer Repair
1700 Old Minden Road, #110
Bossier City, LA 71111
318-742-4943

Bossier Electronics
2349 Julia St.
Bossier City, LA 71112
318-742-6373

Burlet TV & Electronics
1529 Franklin St.
Gretna, LA 70053
504-362-5547

Computer Basics
2112 Enterprise Blvd.
Lake Charles, LA 70611
318-439-6888

Computer Clinic
108 Rena Drive
Lafayette, LA 70503
318-981-1177

Computer Library
322 Danny Park
Metairie, LA 70002
504-455-5330

Missco
1835 River Road North
Baton Rouge, LA 70802
504-387-5131

Oreman Sales, Inc.
2725 Lexington St.
Kenner, LA 70062
504-468-2001

Sound Trek Audio
4401 W. Napoleon, Suite 202
Metairie, LA 70001
504-888-4776

MAINE

Comstock Electronics
1160 Old Gilmore Road
Starks, ME 04911
207-696-3817

RCA Service Co.
2 Thomas Drive
Westbrook, ME 04092
207-775-2328

Rod's Consumer Products
Millcreek Shopping Center
South Portland, ME 04106
207-767-2724

MARYLAND

Advanced Computer Service
287 E. Green St.
Westminster, MD 21157
301-876-8202

Baltimore Gas & Electric
2034 Greenspring Drive
Timonium, MD 21093
301-561-2780

Computer Tech Institute
2401-A Cleanleigh Drive
Baltimore, MD 21234
301-668-2676

Compuvision
8039-B Richie Highway
Pasadena, MD 21122
301-760-5978

Cosmic Computers
1613 Crofton Center
Crofton, MD 21114
301-858-1750

Ford's Typewriter Service
9431-B Madison Ave.
Laurel, MD 20707
301-792-0915

Future Files
2441 Mountain Road
Pasadena, MD 21122
301-437-4320

Laurel Office Machines
504 Main St.
Laurel, MD 20707
301-953-7777

Panaservice
516 S. Broadway
Baltimore, MD 21231
301-327-7220

Professional Micro
100 W. 22nd St.
Baltimore, MD 21218
301-366-0010

Technical Computer Service
8659 Baltimore National
Elliot City, MD 21043
301-461-3451

The Compucats Computer Store
680 West Bel Air Ave.
Aberdeen, MD 21001
301-272-4195

U.S. Office Machines
8907 Rhode Island Ave.
College Park, MD 20740
301-474-1111

MASSACHUSETTS

Atlantic Systems Electronics
Rt. 53, Farmers Market Complex
Hanover, MA 02339
617-826-8760

Digital Rework
133 First St.
Cambridge, MA 02141
617-492-2432

Home Computer Service
14 Main St.
Gardner, MA 01440
617-632-0037

Serviceworld
74–76 Main St.
Framingham, MA 01701
617-872-8701

Tycom, Inc.
112 Elm St.
Pittsfield, MA 01201
413-442-9771

Whalley Computer Associates
Grist Mill Plaza
Southwick, MA 01077
413-569-4931

MICHIGAN

1-2-3 Computer, Inc.
110 Catalpa
Royal Oak, MI 48067
313-399-3990

Bits Computer Systems
204 Center St.
Milford, MI 48042
313-684-1119

Computer Control System
409 S. Leroy
Fenton, MI 48430
313-629-0555

Computer Time
770 Penniman Ave.
Plymouth, MI 48170
313-453-2202

Concraft Computers
9880 E. Grand River #104
Brighton, MI 48116
313-227-7249

Consolidated Enterprises
2715 Bedford Road
Hastings, MI 49058
616-943-5330

Datronics
26325 West 8 Mile Road
Redford, MI 48240
313-535-1633

Electronic Center
1305 Woodside Ave.
Essexville, MI 48732
517-895-5915

Family Computing
11741 N. Saginaw St.
Mt. Morris, MI 48458
313-686-0880

Grahams TV & Furniture
417 McEwan St.
Clare, MI 48617
517-386-3429

Interlink
102 N. Mechanic
Berrien Springs, MI 49103
616-473-3103

Lenawee Computer
825 West Beecher St.
Adrian, MI 49221
517-265-7872

Macomb County Radio
33739 King Richard
Sterling Heights, MI 48077
313-978-0351

National Computer Clinic
1334 Hemphill Road
Burton, MI 48529
313-742-7100

Newman Audio Video
400 32nd St. S.E.
Grand Rapids, MI 49508
616-243-3300

Professional Computer Systems
2603 S. Cleveland Ave.
St. Joseph, MI 49085
616-429-9616

Skory TV
4721 W. Saginaw
Lansing, MI 48917
517-323-7132

The Edge Connector
124 N. Mill
Clio, MI 48420
313-686-1070

MINNESOTA

Accelerated Electronic
4217 Bloomington Ave.
Minneapolis, MN 55407
612-721-2446

Associated Data
5249 West 134th St.
Savage, MN 55378
612-890-0273

Computers ETC.
2133 Cliff Road
Eagan, MN 55122
612-452-1308

Nichols Repair Service
5605 York Ave. South
Edina, MN 55410
612-922-2219

Service Controls
728 North Cedar
Owatonna, MN 55060
507-455-0626

Valiant Inc., Computer Division
224 Commercial
Stillwater, MN 55082
612-439-6743

West Central Computer
208 N.W. 2nd St.
Ortonville, MN 56278
612-839-6155

MISSOURI

Fidelity Telephone
12500A Highway 40 E.
Independence, MO 64055
314-361-8825

Micronomic Corp.
202 Manchester Road
Winchester, MO 63011
314-394-0390

RCA Service Co.
8100 Watson Road
Webster Groves, MO 63114
314-843-4401

MONTANA

Computer Service of Missoula
3325 W. Central
Missoula, MT 59801
406-728-7252

NEBRASKA

Maclad TV
3702 Leavenworth
Omaha, NE 68105
402-345-4228

Micro Creations
4211 O St.
Lincoln, NE 68510
402-489-9454

NEVADA

Hotel Computers
376 W. Sahara Ave.
Las Vegas, NV 89102
702-384-9440

NEW HAMPSHIRE

Cocci Computer Service
1244 Daniel Webster Highway
Manchester, NH 03104
603-622-1188

Computer Junction
178 Hall's Village Road
Chester, NH 03036
603-887-2010

Montgomery Ward
285 Washington St.
Claremont, NH 03743
603-542-5141

Wayne Green Enterprises
200A Perimeter Road
Manchester, NH 03103
603-668-0854

NEW JERSEY

Atom Video & Electronics
100 Ryders Lane
Milltown, NJ 08850
201-745-2700

Computer Guardian
Atsion Road, Oldtown Sq., Suite F
Medford Lakes, NJ 08055
609-953-0884

Dependable Parts
168 Main St.
Chatham, NJ 07928
201-635-5922

ESY Electronic Service
1000 Springfield Ave.
Irvington, NJ 07111
201-373-3111

Family Computer Center
636 Rt. 46 East
Fairfield, NJ 07006
201-882-8370

Family Computer Center
154 Valley St.
South Orange, NJ 07079
201-762-6661

Jonach Electronics, Inc.
623 Route 10
Whippany, NJ 07951
201-428-9440

JRM Electronics
Rte. 206, RR 10
Vincentown, NJ 08088
609-859-2106

National Unlimited Business
Machines
200 Stuyvesant Ave.
Lyndhurst, NJ 07071
201-939-3500

Nubs Computer Center
65 Route 17 South
Hasbrouck Heights, NJ 07604
201-288-6827

The Computer & Software Store
507 9th St.
Ocean City, NJ 08226
609-391-0033

NEW MEXICO

The Video Station
922 New York Ave.
Alamogordo, NM 88310
505-434-4548

NEW YORK

Adwell Audio
158 Main St.
Hempstead, NY 11551
516-485-7100

Central Ventures
42 East 33rd St.
New York, NY 10016
212-686-0930

City Wholesale
59–41 Maurice Ave.
Flushing, NY 11378
718-326-3773

CompuTech
615 South St.
Garden City, NY 11530
516-222-1637

Computer Core Ltd.
5060A Sunrise Highway
Massapequa Park, NY 11762
516-799-1616

Computer Dome
46 Willow St.
Johnson City, NY 13790
607-729-2666

Computer Horizons
13 East Main St.
Westfield, NY 14787
716-326-2212

Computer Underware
75 Broad St.
Tonawanda, NY 14150
716-693-0985

Duane Sales
3901 State St.
Schenectady, NY 12304
518-372-1615

Electra Tech Audio Video
140-11A Cherry Ave.
Flushing, NY 11355
718-463-1192

Entertainment Electronics
3459 Lawson Blvd.
Oceanside, NY 11572
516-536-1313

Galit International
60F South 2nd
Deer Park, NY 11729
516-242-2155

Great Escapes Computer Center
Sun-Vet Mall
Holbrook, NY 11741
516-567-0716

Interboro Electronics
4823 Ave. N
Brooklyn, NY 11234
718-252-1380

Island Video & Computer
51 Modells Shopping Plaza
Centereach, NY 11720
516-467-4352

Island Video & Computer
719 E. Jericho Turnpike
Huntington Station, NY 11746
516-271-9060

Kasara Electronics
33 Murray Hill Drive
Spring Valley, NY 10977
914-356-3131

Marty's Electronic Service Center
72 5th Ave.
Bayshore, NY 11706
516-665-5048

Massena Computer Center
130 Harte Haven Plaza
Massena, NY 13662
315-764-1560

Micro Clinic Service Network
105 State St.
Schenectady, NY 12305
518-783-5404

Micro Computer Repair
639 Scarborough Road
Briarcliff Manor, NY 10510
914-762-1623

Mor Tech Computer Service
Route 49, PO Box 235
Marcy, NY 13403
315-724-7964

National Unlimited Business
Machines
151 Route 52
Newburgh, NY 12550
914-564-3152

Circle 102 on Reader Service card.

VALUWARE

Valuware's Arithmetic Series

More Math for Less

School-aged children who love math or who are having difficulty with it will find *Valuware's* popular and fully-tested subtraction, multiplication, addition, and division software packages just what the teacher ordered.

Why Valuware?

Flexibility. Progressive programs cover skills and concepts in various degrees of difficulty from grades 1–10. Children can advance at their own pace and you don't need to buy new programs every year.

Positive Reinforcement. Musical fanfares and cheerful graphics greet correct answers. Boxscores keep track of correct answers. Users select their own favorite color.

Easy-to-Use. *Valuware* is easy to read and step-by-step instructions are built-in. Successfully tested in the New York City School System.

Teaches. If an incorrect answer is made, *Valuware* helps your child through the tough spots by pointing out where the mistake was made.

Guarantee: Full purchase price refunded if not fully satisfied within 30 days.

Buy 3, Get 1 Free

Price. Low production costs permit *Valuware* to price its high quality software at can't-be-beat prices:

Four Programs

- Addition
- Multiplication
- Subtraction
- Division

Send $19.95 for one; $35 for any two; $50 for three, and get fourth one free. Add $3 for postage and handling.

Valuware
18022 Delano St.
Reseda, CA 91335
(818) 345-3732

Requires a Commodore 64™
Disk Drive
6.5% Sales tax for California residents

Nulogic
939 State St.
Schenectady, NY 12307
518-393-5787

Ray Supply Co.
Upper Glenn St.
Glens Falls, NY 12801
518-792-5848

RCA Service Co.
36766 Old Collamer Road
East Syracuse, NY 13057
315-463-1336

Roan Electronic
171-05 Northern Blvd.
Flushing, NY 11358
718-461-1888

Ski Electronics
13879 Allen Road
Albion, NY 14411
716-589-7711

Software City
1474 Hylan Blvd.
Staten Island, NY 10305
718-351-9271

Software Supermarket
3162½ Delaware Ave.
Kenmore, NY 14217
716-873-5321

Sysut 1 Corp.
2505 Ave U
Brooklyn, NY 11229
718-743-8303

Terminals Co.
87 Nassau St., Room 200
New York, NY 10038
212-233-6356

Thruway Shopping Center
Foot of Oak St.
Walden, NY 12586
914-778-3535

NORTH CAROLINA

Casper Corp.
207 Henderson Drive
Jacksonville, NC 28540
919-347-3355

The Computer Connection
121 Robinson St.
Rocky Mount, NC 27801
919-977-6566

The PC Shop
1318A Central Ave.
Charlotte, NC 28205
704-373-0553

NORTH DAKOTA

Digital Hospital Service
211 Northern Pacific Ave.
Fargo, ND 58102
701-280-0067

Ultra
408 East Bowen
Bismarck, ND 58501
701-258-2546

OHIO

American Trans Video
289 Northland Blvd.
Cincinnati, OH 45246
513-771-2901

B & G Electronics
15729 Madison Ave.
Lakewood, OH 44107
216-521-2855

Bexley Electronics and TV
2733 E. Main St.
Columbus, OH 43209
614-235-0698

Chillicothe Telephone
25 East Second St.
Chillicothe, OH 45601
614-774-6565

Computer Center at Mentor
716 Mentor Ave.
Mentor, OH 44060
216-924-4132

Computer Corner
760 Broadway
Lorain, OH 44052
216-244-2992

Computer Plus of Ohio
127 W. Wyandot Ave.
Upper Sandusky, OH 43351
419-294-5723

D&K Computer Sales/Service
Ohio Valley Mall, Rt. 610
St. Clairsville, OH 43950
614-695-4074

Dales Color TV & Appliance
2236 N. Cleveland Mass Road
Bath, OH 44210
216-659-9339

Ed-Conn Computer Center
120 W. Market St.
Celina, OH 45822
419-586-6523

Fairborn Home Computer
101 N. Broad St.
Fairborn, OH 45324
513-879-7402

Home Electronic Tech
16 Eagle St.
Madison, OH 44057
216-428-6161

Lancaster Computer Center
154 West Main St.
Lancaster, OH 43130
614-654-7667

Marion Computer Center
1205 Delaware Ave.
Marion, OH 43302
614-382-2881

North Coast Programming
35101 Euclid Ave.
Willoughby, OH 44094
216-953-1535

Parma Electronics
3415 Standish Ave.
Parma, OH 44134
216-845-7563

Swallens, Inc.
4861 Spring Grove Ave.
Cincinnati, OH 45232
513-681-2868

Tri Tech Electronics
2044 West State
Fremont, OH 43420
419-332-6631

Valley Micro
227 Youngstown Road
Niles, OH 44446
216-652-1477

Walkers Electronic Service
6729 Basswood Drive
Bedford Heights, OH 44146
216-439-2331

OKLAHOMA

Gemini Computer Store
8972 South Western
Oklahoma City, OK 73139
405-634-2993

Jamware Computer
4813 SE 29th
Del City, OK 73115
405-672-8444

OREGON

C & L Terminals
1215 SE Ivon
Portland, OR 97202
503-231-0772

Computer Service Center
841 NW Bond
Bend, OR 97701
503-382-7882

Computer U.S.E.R.S.
86313 Franklin Blvd.
Eugene, OR 97405
503-726-8500

Computron Business Systems
1142 Willagillespie Road
Eugene, OR 97401
503-683-5517

Computron Business Systems
11705 S.W. Pacific Highway
Tigard, OR 97223
503-639-6780

Movie Magic
201 Tigard Plaza
Tigard, OR 97223
503-620-5151

Software Plus
358 Warner-Milne Road
Oregon City, OR 97045
503-657-5215

The User's Corner
1133 S. Riverside, Suite 10
Medford, OR 97501
503-773-8868

PENNSYLVANIA

Aid Computers
206 N. Sherman St.
York, PA 17403
717-843-0146 or 854-9411

Alarm Installer
463 Baily Road
Yeadon, PA 19050
215-259-2656

Alpha Omega Computer
100 Liberty St.
Warren, PA 16365
814-726-2300

Alpha Omega Computer
928 Broadhead Road
Aliquippa, PA 15001
412-375-4848

Arnold Electronic Systems
550-A West Street Road
Warminster, PA 18974
215-675-4227

Business Computer Products
24 Northmill St.
New Castle, PA 16101
412-654-2999

Chucks Electric Repair
6169 Elmswood Ave.
Philadelphia, PA 19142
215-724-6074

Computer Corner
Rts. 63 & 309
North Wales, PA 19454
215-643-5030

Computer Techs
107 Sixth St., Suite 815
Pittsburgh, PA 15222
412-391-4197

CTE
1121 Mary Ann St.
Pittsburgh, PA 15203
412-481-5690

Data Softique
105 Holiday Park Drive
Pittsburgh, PA 15239
412-327-1850

Data Softique
928 Presque Isle Plaza
Pittsburgh, PA 15239
412-327-1955

Downingtown Computer Center
719 E. Lancaster
Downingtown, PA 19335
215-269-3025

Electronic Repair Center
823 Union Blvd.
Allentown, PA 18103
215-432-6332

Energy Center
Bazaar Shopping Center, Store 417
Clifton Heights, PA 19018
215-623-3911

Erie Computer Co.
2765 West 8th St.
Erie, PA 16505
814-838-6386

Groves TV & Computers
2407 Pennsylvania Ave.
West Mifflin, PA 15122
412-466-3313

Imtech
183 West Lancaster Ave.
Paoli, PA 19301
215-647-5104

Kiblers Independent TV
400 Meldon Ave.
Donora, PA 15033
412-379-7340

Main Street Software
172 Main St.
Landisville, PA 17538
717-898-2946

MVS Electronics
119 First St.
Irwin, PA 15642
412-863-9436

North Central Digital Systems
800 Continental Blvd.
Danville, PA 17821
717-275-7713

Office Improvements
Strawberry Square Arcade
Harrisburg, PA 17101
717-232-0831

Office Improvements
I-83 Industrial Park
Manchester, PA 17345
717-767-6793

Parke T. Morrow
627 West 26th St.
Erie, PA 16508
814-455-7566

Peripherals Computer & Supply
2232 Perkiomen Ave.
Mt. Penn, PA 19606
215-779-0522

Personal Micro Systems
316 North Main St.
Butler, PA 16001
412-282-1773

Pittsburgh Computer Store
47 Clairton Blvd.
Pittsburgh, PA 15236
412-655-8220

Showers Electronic Service
340 Walnut St.
Mifflinburg, PA 17844
717-966-1774

Software Unlimited
934 Woodbourne Road
Levittown, PA 19056
215-949-0400

Warren Radio
1315 Peach St.
Erie, PA 16512
814-454-5281

World of Computers
551 Main St.
Johnstown, PA 15901
814-535-7718

PUERTO RICO

RRM
713 Andalucia St.
Rio Piedras, PR 00920
809-781-1083

RHODE ISLAND

Future Images
390 Clinton St.
Woonsocket, RI 02895
401-766-0075

International Computer Service
165 Dyerville Ave.
Johnston, RI 02919
401-273-1001

SOUTH CAROLINA

Bytes and Bits
28 Diamond Lane
Columbia, SC 29210
803-772-9044

Electronic Service & Appliance
Star Rt. 5, Box 71
Beaufort, SC 29902
803-524-4613

Software Solutions
1812 Highway 7
Charleston, SC 29407
803-571-2983

SOUTH DAKOTA

Hi Tech Service
409 Maple
Rapid City, SD 57701
605-341-4888

Sodak Electronics
1418 East 3rd St.
Sioux Falls, SD 57103
615-361-0632

TENNESSEE

Bristol Micro Technology
1115 Shelby St.
Bristol, TN 37620
615-968-1146

Cardinal Computers
2509 C. North Ocoee Village Square
Cleveland, TN 37311
615-472-0175

Data International
5236 Hixon Pike
Chattanooga, TN 37343
615-875-8540

Integrated Systems
3865 Viscount, Suite 14
Memphis, TN 38118
901-365-2495

Max Marler TV
5110 Hixson Pike
Chattanooga, TN 37343
615-877-0056

Mid-South Computer Service
240 Lindell St.
Martin, TN 38237
901-587-2091

RCA Service Co.
4121 South Creek Road
Chattanooga, TN 37406
615-698-2551

Video Home Library
275 Main Street East
Oak Ridge, TN 37830
615-482-3893

TEXAS

B & L Computer Service
105 N. McKinney, Suite B
Richardson, TX 75081
214-644-3770

B&L Computer Service
4010 Joseph Hardin, Suite 280
Dallas, TX 75236
214-337-4876

Computer Hardware Service
43H White Chapel
Roanoke, TX 76262
817-481-5445

Computer Support Group
404 South Dogwood St.
Pharr, TX 78577
512-781-2459

Com Soft
27043 Mesa Verde Drive
Magnolia, TX 77375
713-356-5257

Electronic Shop
2820-24 Walnut Lane
Dallas, TX 75229
214-350-4003

General Electronix Co.
1406 Airline Gulfway
Corpus Christi, TX 78412
512-992-3913

Havel Camera
1102 Basse Road
San Antonio, TX 78212
512-735-7412

J & M Electronics
4766 Research Drive
San Antonio, TX 78240
512-699-0404

Lake Texoma Marine Electronics
Highway 56, Rt. 2, Box 181
Southmayd, TX 76268
214-892-0290

Micro Fix
2019 Montana
El Paso, TX 79903
915-532-7708

Micro Fix
7062 Bissonnet
Houston, TX 77074
713-541-9888

Radio Shack
323 S. Brazosport Blvd.
Freeport, TX 77541
409-233-2480

Raven Comtech
3213 N. Highway 67, Suite 105
Mesquite, TX 75150
214-681-4433

South Texas Electronic
7002 McPhearson, Suite 11
Laredo, TX 78041
512-727-2051

Southwest Computer Center
5603 N. Highway 35, Suite 1
Laredo, TX 78041
512-724-1133

Tarpley Radio & TV
1108 West Adams
Temple, TX 76501
817-773-5928

TMS
106 Jefferson St.
Pittsburg, TX 75686
214-856-5449

Total Electronics
600 N. Shepherd, Suite 102
Houston, TX 77007
713-497-7404

Transworld Technology
931 Burr Road
San Antonio, TX 78209
512-649-1940

UTAH

Dynamic Service
1814 S. Columbus Lane
Orem, UT 84058
801-225-3044

Integrated Computer Systems
2255 N. University Parkway 39
Provo, UT 84604
801-373-2901

Southwest Educational
1552 W. 200 N.
Cedar City, UT 84720
801-586-9971

Tritronix
5740 Copper City Drive
Salt Lake City, UT 84120
801-534-7507

United Service & Computer
790 South Main St.
Logan, UT 84321
801-753-3709

VERMONT

Jim & Sons Electronics
135A Vershire Center Road
Vershire, VT 05079
802-333-4078

VIRGINIA

Alpha Electronics
1824B South Main St.
Harrisonburg, VA 22801
703-434-4373

B & K Technical Service
602 E. Nine Mile Road
Highland Springs, VA 23075
804-737-5180

Commercial Business Systems
504 Research Road
Richmond, VA 23236
804-379-0783

Computer Repair Technology
2812D Marrilee Drive
Fairfax, VA 22031
703-849-8558

Family Computer Center
11917 Fair Oaks Mall
Fairfax, VA 22033
703-385-2758

Jack Hartman Co.
2840 Peters Creek Road
Roanoke, VA 24019
703-362-1891

J & D Electronics
1113 West Church Road
Sterling, VA 22170
703-450-4237

Maurice TV & Electronics
4000 E. Indian River Road
Chesapeake, VA 23325
804-420-1642

STS Video Supply
1073 West Broad
Falls Church, VA 22046
703-237-0558

Unidyne Corp.
3835 E Princess Anne Road
Norfolk, VA 23502
804-855-8037

CWC/Peterborough
is proud to announce
the arrival of

AMIGA
WORLD

on the newsstands now.

Viewtronics Service
125 Battlefield Blvd.
Chesapeake, VA 23320
804-482-2700

Viewtronics Service
7923 Chesapeake Blvd.
Norfolk, VA 23518
804-588-3366

WASHINGTON

Accurate Data Service
N. 3017 Monroe
Spokane, WA 99205
509-325-1268

American Mercantile Co.
2450 First Ave. South
Seattle, WA 98134
206-624-6141

Audiophile Mikes
1856 N. Wenatchee
Wenatchee, WA 98801
509-662-0751

Bellingham Computer
2300 James St., Suite 1-E
Bellingham, WA 98225
206-647-0086

Butler's TV and Computer Service
28717 Pacific Highway S.
Federal Way, WA 98003
206-941-9096

Computron Business Systems
64 W. Nob Hill Blvd.
Yakima, WA 98902
509-457-6900

Com-Soft
1831 W. Silver Lake Road
Everett, WA 98204
206-338-0934

Computer Corner
1730 Continental Place
Mt. Vernon, WA 98273
206-428-1840

Computer Sales and Service
113 W. 3rd Ave.
Moses Lake, WA 98837
509-765-9751

Digital Test Systems
602 W. Main
Centralia, WA 98531
206-736-2628

Erik's Place
12708 167th Place NE
Redmond, WA 98052
206-883-7404

Harbor Elec/Comm
2614 Simpson Ave.
Hoquiam, WA 98550
206-532-3474

J & S Electronics
1000 South Young
Kennewick, WA 99337
509-783-3534

Russell & Associates
10453 N.E. Fourth Plain Blvd.
Vancouver, WA 98662
206-892-8036

Take A Byte
815 West Columbia Drive
Kennewick, WA 99336
509-582-3311

The Future Computers
321 South Meridian
Puyallup, WA 98371
206-845-9673

TS Electronics
15101 Union Ave.
Tacoma, WA 98498
206-588-1510

Wolzs Repair & Consulting
616 Bryant St.
Walla Walla, WA 99362
509-522-0695

WEST VIRGINIA

Computers Plus
2077 Charleston Town Center
Charleston, WV 25389
304-342-4848

J.S. Latta, Inc.
1502 4th Ave., Box 2668
Huntington, WV 25726
304-523-9433

Quality TV Service Center
908 West Pike St.
Clarksburg, WV 26301
304-622-5180

Solid State Sales & Service
2645 Charles St.
Wellsburg, WV 26070
304-737-2467

Southside A V Exchange
1010 10th St.
Huntington, WV 28701
304-522-7283

Stone Church Video
RD 2, Stone Church Road
Wheeling, WV 26003
304-242-0980

WISCONSIN

Active TV
4234 North Teutonia Ave.
Milwaukee, WI 53209
414-444-0117

Cash Control Systems
2104 Highway 12
Eau Claire, WI 54701
715-832-9922

Comtech Industries
610 McKinley St.
Wisconsin Rapids, WI 54494
715-424-4169

Mister TV Service
5455 W. Burleigh St.
Milwaukee, WI 53210
414-873-2415

Oryx Systems
425 1st St.
Wausau, WI 55401
715-848-1374

Systech Electronics
9617 W. Greenfield Ave.
Milwaukee, WI 53214
414-421-5597

The Help Key
631 N. Mayfair Road
Wauwatosa, WI 53226
414-774-HELP

TMW Software
207 Scott St.
Wausau, WI 54401
715-845-7638

Woods Electronics
3335 London Road
Eau Claire, WI 54701
715-832-7143

Circle 91 on Reader Service card.

Copy Worldwide Short-wave Radio Signals on Your Computer

Remember the fun of tuning in all those foreign broadcast stations on the short-wave radio? Remember those mysterious sounding coded tone signals that baffled you? Well, most of those beeps & squeals are really digital data transmissions using radioteletype or Morse code. The signals are coming in from weather stations, news services, ships & ham radio operators all over the world. Our short-wave listener cartridge, the "SWL", will bring that data from your radio right to the video screen. You'll see the actual text as it's being sent from those far away transmitters.

The "SWL" contains the program in ROM as well as radio interface circuit to copy Morse code and all speeds/shifts of radioteletype. It comes with a cable to connect to your radio's speaker/earphone jack, demo cassette, and an excellent manual that contains a wealth of information on how to get the most out of short-wave digital DXing, even if you're brand new at it.

For about the price of another "Pac-Zapper" game, you can tie your Commodore 64, 128 or VIC-20 into the exciting world of digital communications with the Micrologn SWL. $64. Postpaid, U.S.

MICROLOG CORPORATION,
18713 Mooney Drive,
Gaithersburg, Maryland 20879.
Telephone: 301 258-8400.

MICROLOG
INNOVATORS IN DIGITAL COMMUNICATION

SWL
MICROLOG
Copyright 1985 MICROLOG

Circle 135 on Reader Service card.

ENTERTAINMENT SOFTWARE DESIGNERS

MicroProse Software — the leader in simulation software for home computers, is looking for a few of the best top-flight professionals to join our rapidly growing simulation software design team in beautiful Hunt Valley, Maryland. Qualified individuals will have a genuine interest and commitment to game design and experience in machine language programming on 6502, 8088, or 68000 microcomputers.

We offer a challenging, super-charged environment where your outstanding effort and commitment will be recognized and rewarded. You'll be part of a first-rate design team — our simulations continue to be ranked at the top of the software best-seller charts. So, if outstanding compensation, profit sharing, future equity, recognition and the opportunity to be part of a dynamic organization is what you're aiming for, send your resume and an example of your best work in a hurry to:

John Harris
Manager, Software Department

MICROPROSE
SIMULATION • SOFTWARE
120 LAKEFRONT DRIVE • HUNT VALLEY, MD 21030 • 301-667-1151

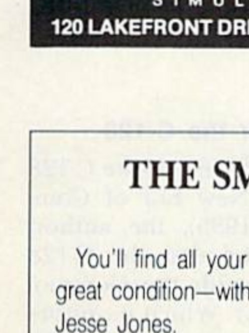
THE SMART WAY TO SAVE YOUR *RUN*

You'll find all your favorite issues of **RUN** in minutes—and in great condition—with smart-looking binders or file cases from Jesse Jones.

Sturdy, protective file cases make for easy access to each issue, while rugged binders allow magazines to lay flat for easy reference. Both hold 12 issues, are custom-designed in brown with gold spine lettering, and are **unconditionally guaranteed.**

Order today!
File Cases: $6.95 ea.; 3/$20; 6/$36.
Binders: $8.50 ea.; 3/$24.75; 6/$48.

YES! Please send me protection for my **RUN**:



________ File Cases ________ Binders
I enclose my check or money order for $________
Name ________
Address ________
City ______ State ______ Zip ______

US currency only. Outside US, add $2.50 per item for postage and handling. Please allow 4-6 weeks for delivery.

MAIL TO: Jesse Jones Box Corp., PO Box 5120, Dept. RUN, Philadelphia, PA 19141

Circle 74 on Reader Service card.

PROFESSIONAL
HANDICAPPING SYSTEMS
• PRESENTED BY PROFESSOR JONES •

GLD. Thoroughbred "Gold" Edition™
A "Full" featured thoroughbred analysis designed for the professional and the serious novice. **$159.95** complete

EGLD. Enhanced "Gold" Edition™
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke." (Master Bettor™ included) **$199.95** complete

GLTD. Limited "Gold"™
Enables **Professional Handicappers** to assign specific values to the racing variables "they" feel are important. Create program weight based on a particular track and fine tune it for **maximum** win percentage. This program is designed for "ease of use." The user needs **no programming experience.** (contains Integrated Bettor™) **$299.95** complete

GD. Gold Dog Analysis™
The "ONLY" professional greyhound analysis available that evaluates ALL variables. **$149.95** w/integrated Bettor **$199.95** Limited Version **$299.95**

MHH. Master Harness Handicapper™
Professional software designed to provide a thorough analysis of all trotter and pacer races in North America and Canada. **$159.95** complete **$199.95** w/integrated Bettor Limited **$299.95**

Professor Pix Football™
Complete STATISTICAL ANALYSIS on Data Base allowing "Designated" previous games to be evaluated. Statistical Series **$99.95** w/Win-Loss Power Ratings **$149.95**

NBA. Basketball™
NBA **$99.95** w/college **$129.95** w/power ratings **$149.95**

LOT. Lottery Analysis™
Statistical comparison program designed to detect subtle patterns in winning numbers and digits. Lottery (3-4 digit) **$79.95** w/Lotto (Max. 99 Digit) **$99.95**

PC-3 Portable Computer (4k) with choice of Thoroughbred, Greyhound or Trotter™ **$249.95** (Includes portable computer and program.)

M-100 Portable (24k) w/choice of Thoroughbred, Greyhound, or Trotter **$649.95** (Includes portable computer and program.)

BROCHURE AVAILABLE

IBM™
APPLE™
TRS-80™
CPM™
COMMODORE™

Prof. Jones
1940 W. State St.
Boise, ID 83702

VISA MasterCard

48 HR. FREE SHIPPING

☎ CALL
208-342-6939

TERMS: FREE SHIPPING ALL SOFTWARE. Add $6.00 hardware / $6.00 C.O.D. / UPS Blue $6.00 / Out of Country $9.00 / ID Residents 4% / 3 weeks personal checks / Cash price only add 2% Visa, MC / Prices subject to change.

Circle 219 on Reader Service card.

HUNGRY?
FOR MORE TIME ON YOUR C64, VIC-20 OR C128?

The
SERIAL BOX
. . . LETS YOU COMPUTE WHILE YOUR PRINTER PRINTS!

Works with all COMMODORE printers AND all serial printer interfaces.

CONNECT IT AND FORGET IT!

The
SERIAL BOX
is a 64K Serial Port Turbobuffer.

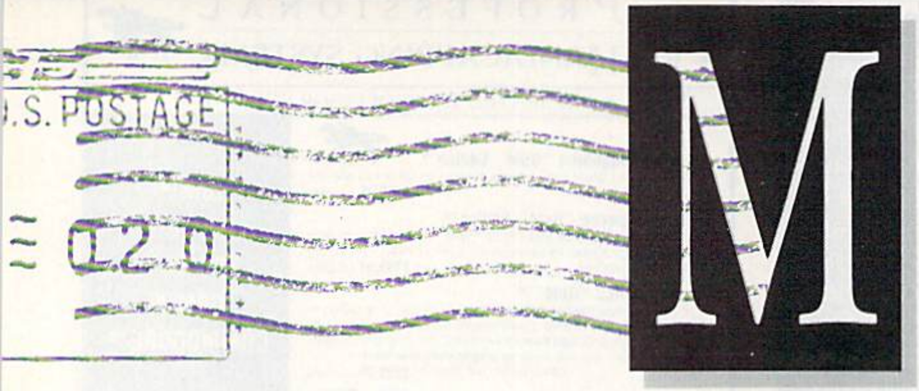
ONLY $49.95 COMPLETE

CALL 1 (800) 228-7264 FOR ORDERS AND INFO
IN PA CALL (215) 622-5495
OR WRITE. . .

R. J. Brachman Associates, Inc.
P.O. BOX 1077 HAVERTOWN, PA 19083

Please add $3.00 for shipping and handling (USA and Canada)
VISA, MC, Check or M.O. accepted. C.O.D. add $2.50.
PA residents add 6%
(Please allow 4 — 6 weeks for delivery)
*C64, VIC-20 & C128 are registered trademarks by Commodore Business Machines, Ltd.

THE MAIL RUN



Ham Software Update

I was very pleased to see The Contester mentioned in your New Products RUNdown in the September issue of *RUN*. For small software houses like Winner's Edge, this sort of attention is very important.

Unfortunately, I felt that in the necessary cutting of our press release to fit your space requirements, two key points were missed.

First, logging and duplicate contact checking are fully integrated with automatic transmission of Morse code, including all of the most-needed contest transmissions.

This leads directly to the second key point and the real strength of the package. Unlike anything before it, The Contester is designed for practical real-time use during amateur radio contests. Every function has been optimized from the standpoint of the contest operator. I have been a contester for over a decade, and the program incorporates everything I have learned during that time.

Peter G. Smith, N4ZR
President, Winner's Edge Software
Reston, VA

Basic 4.5 Enhancement

Many thanks to *RUN* magazine and Robert Rockefeller of Ontario for the absolutely terrific series on Basic 4.5 (June, July, August 1985 issues). I typed everything in, and it worked great! The added disk commands are as handy as just about anything going, as long as you can live with the slight shortage of RAM for your program.

I would like to offer one enhancement for users of Basic 4.5. After typing and running all of the loader programs that you want to include in your own version of Basic 4.5, type in the following commands in the Immediate mode.

```
POKE 43,0: POKE 44,128: POKE 45,1: POKE
46,160:SAVE"4.5 BASIC ML",8 {RETURN}
```

After the disk drive settles down, you will have on the disk a complete copy of Basic 4.5 in machine language format. Then, when you want to install it, just type:

```
LOAD"4.5 BASIC ML",8,1 {RETURN}
```

and then

```
SYS 64738 {RETURN}
```

and the 4.5 screen will appear with all of the commands available! Using this technique precludes the need to load and run all of the individual loader programs every time you want 4.5 installed.

Donald Graham
Baltimore, MD

A Time-Saving Disk Utility

In regard to Robin Franzel's article, "The Key to Your Disk Directory" (August 1985)—fantastic!

This is what I've been looking for! I've been using Mike Konshak's Datafile programs (*RUN*, November and December 1984) and found that I was wasting a lot of time returning to the main program just to use the @ command to call up the directory. Franzel's program eliminates all that.

I looked up Robin Franzel's screen dump utility ("Print Your Screen") in *RUN*'s December 1984 issue. Again, fantastic! It works beautifully with Datafile.

Anna I. Jackson
Paducah, KY

Monitor for the C-128

In your initial review of the C-128 ("The C-128—A New Era of Compatibility," May 1985), the author, Guy Wright, stated that the C-128 would not work with the Commodore 1702 monitor. Which monitors (besides the one being developed by Commodore for the C-128) will work with this machine?

When Commodore was developing the C-128, why didn't they also develop an adapter so the C-128 could be used with the 1702? It would be nice to have a C-128, but on my budget and considering that I don't need many of the new capabilities, I'll just stick with the C-64.

Ralph G. Close, Jr.
Ridgecrest, CA

First of all, you can use the 1702 monitor with the C-128, and you can use it as is—you don't need an adapter. To use the monitor in 80-column mode, you need only connect a cable, which you can make or buy, to the RGBI port (see Margaret Morabito's article, "C-128 Monitors," RUN, *October 1985). A few third-party* *manufacturers (Cardco, for instance) are coming out with such cables.*

As for other monitors that you can use with the C-128, there are several. You can use any third-party monochrome monitor, such as Zenith or Taxan. These monitors will work in both 40- and 80-column modes. Also, any RGBI color monitor will work with the C-128. The Sears RGBI monitor/color TV will give you a full range of color in both 40- and 80-column modes.

Editors

No More Mistakes

Thank you for your checksum program, Perfect Typist, which you published in your September 1985 issue. In the previous 15 months that I've had *RUN*, I would always make a mistake when typing in a program's Data statements. This month, I've typed all of the programs and not one of them has a mistake in it.

With the checksum, I can type programs ten times faster and more accurately.

Michael Traina
Carteret, NJ

Assembly Language Made Easy

I am a very amateur computer buff, who has been trying to understand machine language for some time. Most articles and books have been a disappointment. At the outset, I would feel I knew what was going on; then, all of a sudden, I would be completely lost. They seemed to jump from the obvious to the esoteric.

Your series on assembly language over the last few months has been great! I now have Mr. Sanders' assembler program on tape, and the light begins to dawn. I even find that other previously published articles on assembly language begin to make more sense.

Jean P. Nance
St. Joesph, IL

This Publication is available in Microform.

University Microfilms International

Please send additional information
for ______
Name ______
Institution ______
Street ______
City ______
State ______ Zip ______

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

ATTENTION
Foreign Computer Stores
Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that CW/Peterborough provides.

Provide your audience with the magazine they need and make money at the same time.

For details on selling **80 MICRO, inCider, HOT CoCo, RUN** contact:

SANDRA JOSEPH
WORLD WIDE MEDIA
386 PARK AVE., SOUTH
NEW YORK, NY 10016
PHONE (212) 686-1520
TELEX—620430

THE SMART WAY TO SAVE YOUR *RUN*

You'll find all your favorite issues of **RUN** in minutes—and in great condition—with smart-looking binders or file cases from Jesse Jones.

Sturdy, protective file cases make for easy access to each issue, while rugged binders allow magazines to lay flat for easy reference. Both hold 12 issues, are custom-designed in brown with gold spine lettering, and are **unconditionally guaranteed.**

Order today!
File Cases: $6.95 ea.; 3/$20; 6/$36.
Binders: $8.50 ea.; 3/$24.75; 6/$48.

YES! Please send me protection for my **RUN**:
______ File Cases ______ Binders
I enclose my check or money order for $ ______.
Name ______
Address ______
City ______ State ______ Zip ______
US currency only. Outside US, add $2.50 per item for postage and handling.
Please allow 4-6 weeks for delivery.

MAIL TO:
Jesse Jones Box Corp.
PO Box 5120-Dept. RUN
Philadelphia, PA 19141

NEW PRODUCTS RUNDOWN

Compiled by HAROLD R. BJORNSEN

Lights! Camera! Action!

Show Director, an educational program for children ages 8–12, lets your child create a variety of shows using pictures, animation, text, music and sound effects. Available on disk for the C-64 at $34.95. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062.

Check Reader Service number 413.

C-64 Enhancement System

Stardos (Starpoint Software, Star Route, Gazelle, CA 96034) is a plug-in enhancement system for the C-64 and disk drive that increases the speed of your drive. The speed improvements are active on Load, SEQ, REL, USR, Save and other access commands. The speed of many disk drive commands, such as New, Scratch, Validate and Memory-Write, is also improved.

Stardos is compatible with your entire software library. Available for $64.95.

Check Reader Service number 414.

Overnight Sensation

Learning Guitar Overnight, a tutorial music program for the C-64, teaches basic chord recognition. Strum-along sound effects allow you to recognize and play simple songs immediately. Learning Guitar Overnight is available on disk for $39.95 from Chipware, PO Box 110, Chester, NH 03036.

Check Reader Service number 416.

For Little Game Makers

Mr. Pixel's Game Maker, a game-generator program, lets children create their own computer games while learning to program.

Children aged eight and older can play several example games included on the disk, write simple programs that change the actions of characters or use conditional (If...Then) statements to change or establish game rules.

The package can be used in conjunction with Mr. Pixel's Programming Paint Set and Mr. Pixel's Cartoon Kit. It's available for the C-64 for $29.95. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062.

Check Reader Service number 408.

Printmaster/S

Omnitronix (PO Box 43, Mercer Island, WA 98040) has released Printmaster/S, an RS-232 printer interface that plugs into the Commodore serial bus and provides complete RS-232 signals for use with any RS-232 printer. It also supports all Commodore graphics and graphics characters.

The Printmaster/S is switch-selectable for 300, 600, 1200 and 2400 baud, plus parity, word and stop bits. Available for $119.95.

Check Reader Service number 415.

Peace of Mind

Spectrum 1 Network (9161 Beachy Ave., Arleta, CA 91331) has released Peace of Mind, the first in its Down to Earth software series for the C-64.

The package includes four separate programs. Home Inventory allows you to input important information on up to 200 personal belongings. Credit Card Guardian holds complete data on up to 60 credit cards. Private Messages allows you to store up to 100 lines of messages or other text, and Vital Statistics provides up to 50 pages of important facts about bank accounts, insurance, investments and important names and addresses.

Peace of Mind is available on disk for $19.95.

Check Reader Service number 409.

C-128/80

Cardco (300 S. Topeka, Wichita, KS 67202) has released C-128/80, a five-foot video adapter cable that enables the C-128 to output 80-column monochrome displays to any standard composite video monitor. The cable connects to the computer's RGBI port and the monitor's video input jack. Available for $9.95.

Check Reader Service number 410.

Colonial Conquest

Colonial Conquest is a joystick-controlled strategy game. In the struggle for world dominance, each player controls one of six countries and orders troops and fleets to attack any number of 131 territories. The game is available on disk for the C-64 at $39.95 from Strategic Simulations, Inc., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043.

Check Reader Service number 411.

Three from RAK

RAK Electronics (PO Box 1585, Orange Park, FL 32067) has released three programs for the C-64.

Games Disk includes five games: blackjack, Poker-64, craps, slots and Star Trek.

Utilities Disk includes six programs: C-64 Type-Right, a word processor; C-64 Typing Tutor; Finance; Super Budget; Super Checkbook and Sales/Expense.

Ham Radio Disk comes with 12 amateur radio applications programs, including Ham Antennas, Morse

1-800 -843-6700 **TO ORDER CALL TOLL FREE** 1-800-843-6700

DON'T WAIT UNTIL THE LAST MINUTE !! AT THESE PRICES IT'S FIRST COME FIRST SERVED. SOME QUANTITIES LIMITED.

INCREDIBLE VALUE!!!

	RETAIL	SELL
Sanyo Monitors		
DMC 5500 Color Composite	$359.00	$229.00
DM2112 Green	$118.00	$79.95
DM2212 Amber	$118.00	$79.95

DOLLAR DISKS !!

We know of no better disks at any price. Lifetime warranty.

SS/DD ONLY $1.00 EACH
DD/DD ONLY $1.15 EACH
OTHER BRANDS ALSO.
CALL FOR PRICE.

SPECIALS FOR THE C-64

RAINBOW QUEST (D&C)	9.95
FINANACIAL COOKBOOK	29.95
INVENTORY CONTROL	24.95
ARCHON	19.95
MOVIE MAKER	26.95
PRACTICALC (C)	8.95
ADV. MACH. LANG.	9.95
SUPER DISK UTILITY	12.95
PRINT SHOP	29.95
INDIANA JONES	19.95
PAPER CLIP	54.95
MAIL CONTROLLER	19.95
CUT AND PASTE	19.95

SPECIALS FOR YOUR VIC-20

ALL PRODUCTS LISTED BELOW CAN BE YOURS FOR ONLY $8.57 PER ITEM!

PRACTICALC (C)
SUB COMMAND (C)
ALIEN BLITZ (C)
SNACKMAN (C)
SPIDERS OF MARS (C)
VIC REVEALED (BOOK)
MOLE ATTACK (CART)
CROSSFIRE (C)
MATH DUEL (C)
REVERSAL (C)
STEALTH (C)
CAR CHASE (C)
OUTWORLD (C)
QUBIC (C)
AGGRESSOR (C)
GORTEK & THE MICROCHIPS (DISK)

PICO PRODUCTS SPECIAL

GLARE GUARDS FOR YOUR CRT

THESE SCREENS ARE AVAILABLE FOR COLOR OR MONO.(PLEASE SPECIFIY).

- *FINE NYLON MESH
- *EASY ATTACHMENT WITH VELCRO STRIPS
- *REVERSIBLE BLACK OR CREAM COLOR
- *PREVENTS DUST ACCUMULATION

ONLY 19.95 FOR 12" AND 24.95 FOR 14"

BROTHER HR-10 DAISY WHEEL PRINTER

Finally! A letter quality printer at a price you can afford...
List Price- $349.00
Your Low Price ONLY- $299.00
The HR-10 is designed to keep pace with modern computing needs by producing sharp, beautiful letter quality text. Thanks to a 2K buffer and bidirectional printing, HR-10 gets everything onto the page quickly and accurately. The sprocket wheel feeder TF-10, which keeps fanfold paper flowing smoothly and efficiently, is standard equipment. A shadow print feature lets you highlight words or phrases so they stand out from the rest of the text. Other features such as superscript and subscript, auto-underline and carriage skip movement provide versatility usually found on more expensive models.

Other printers also available:

	RETAIL	SELL
Brother HR-15 Letter Quality	$599.00	$349.00
Olympia-RO Letter Quality	$429.00	$289.95
Epson Homewriter Dot Matrix	$269.95	$219.95
Epson LX0-80 Dot Matrix	$299.00	$249.95
Epson FX100 Dot Matrix	$849.95	$549.95

DON'T MISS THESE HANDY HELPERS!!

	RETAIL	SELL
Datarack Head Cleaning Kit	$15.95	$12.95
Head Cleaning Kit (c2017)	$16.95	$7.95
Datamatrix Head Cleaner	$6.99	$4.95
Anti-Static Spray Texwipe	$5.95	$4.95
Checkmate Anti-Static	$3.88	$2.95
Disk Pac 3 1/2" Blue and Black	$14.95	$7.95
Disk Pac 5 1/4" Blue and Black	$13.95	$6.99
Disk File (6)	$2.95	$.99
Teak Rolltop Disk Storage (5 1/4 holds 50)	$32.95	$18.95
Teak Rolltop Disk Storage (3 1/2 holds 45)	$23.95	$14.95
Data Defender 70 (5 1/4 holds 70)	$26.95	$14.95
Data Defender 15 (5 1/4 holds 15)	$4.49	$2.99
Flip 'N' File 50 (5 1/4 holds 50)	$19.95	$9.95
Cassette Storage (6) Black and Blue	$4.99	$.99

Protect Your Software
FLIP 'N' FILE /15
Protect Software from dust, debris and moisture.
Stores up to 15 5¼ diskettes.
List Price $9.95 **Sale $7.95**

Also Available	LIST	SALE
Flip 'n' File /50	$19.95	**$14.95**
Data Defender /35	$ 9.95	**$ 7.95**
Data Defender /70	$26.95	**$19.95**
Roll Top /100	$49.95	**$39.95**

instant Software

computer centers

TO ORDER CALL TOLL FREE 1-800-843-6700 OR CLIP AND MAIL:

INSTANT SOFTWARE
82 MAIN ST.
KEENE , NH 03431

NAME______________________________
ADDRESS__________________________
CITY______________________________
STATE______________ZIP____________

IN NH CALL 603-352-3763
MC, VISA M.O. OR CHECKS OK. PLEASE ADD 3.00 FOR SHIPPING AND HANDLING

BOSTON
355 BOYLSTON
617-353-1582

ACTON
427 GREAT RD
617-263-0418

HUDSON
35 LOWELL RD
603-883-8080

KEENE
82 MAIN ST
603-352-3736

NASHUA
NASHUA MALL
603-889-0084

Circle 119 on Reader Service card.

A REAL-TIME WW II SUBMARINE SIMULATION

DAWN PATROL

- SUBCOM assigned missions such as *Seek and Destroy*
- Computer generated speech simulates actual radio transmissions
- Multiple screens - radar, damage reports & periscope view/control panel
- Full color graphics - 3D perspective
- Trigonometric transformations for precise plotting
- Match your strategy against the enemy

C64 and C128 Disk or Cassette $24.95

Trivia Flight

The Ultimate Party Game for 1-6 players or teams ages 13 and older

- Over 4000 Questions and Answers
- Game Master Controls The Play
- Double or Lose It Bonus Questions
- Catch Up The Loser Sequence
- Tie Breaker Function
- Help and Save Features

C64 and C128 3 Disks $26.95

MARK OF THE FALCON
2190 W. Drake, Suite 177
Ft. Collins, CO 80526
(303) 226-1960

VISA, MC, Money Order, Checks

Circle 241 on Reader Service card.

the 21 Second Back-up NEW

AN IDEA WHOSE TIME HAS COME! $79.95

THE COPY PROGRAM

- EXACT COPIES IN ONLY 21 SECONDS
- SIMPLE-FULL BACK-UP IN A SINGLE KEY STROKE
- RELIABLE—WORKS VIRTUALLY EVERY TIME

NASHUA DISKETTES $10.95 bx

UNIVERSAL
475 MAIN ST FARMINGDALE, NY 11735
(516)753-0110

MASTERCARD, VISA, M.O. OR CHECK
NY ORDERS ADD SALES TAX
Prices are mail order only and do not include shipping & handling

New Products RUNdown

Trainer, Morse Code, WAS Record, WAZ Record and DXCC Record.

Each program is available for $14.95.

Check Reader Service number 405.

New Peek A Byte Version

Peek A Byte 64, Version 2.0, with the Disk Mechanic, is a new version of the disk and memory utility for the C-64 and 1541 disk drive.

The new program features a track/sector editor that reads and writes all disk tracks, including half tracks. In addition, the Disk Mechanic can copy track formats from one disk track to another, and can erase the format either completely or on a range of tracks.

Peek A Byte comes with the DOS Wedge 5.1 for simplified DOS commands and can be used with a machine language monitor program without losing disk data stored by Peek A Byte. Available for $35 from Quantum Software, PO Box 12716, Lake Park, FL 33403.

Check Reader Service number 406.

Dr. Seuss Puzzler

Dr. Seuss Fix-up the Mix-up Puzzler is an electronic jigsaw puzzle for children featuring six storybook characters. Each puzzle is randomly designed by the computer, allowing for different combinations and five skill levels to choose from. When the puzzle is completed correctly, the Dr. Seuss characters come to life through on-screen animation. Available on disk for the C-64 at $29.95 from CBS Software, One Fawcett Place, Greenwich, CT 06836.

Check Reader Service number 407.

1541 Disk Manager

Tidal Bore Software (230 Pleasant St., Truro, Nova Scotia, Canada B2N 3S8) has released the 1541 Disk Manager, a menu-driven program for the C-64.

The program keeps your disks organized, sends most disk commands, copies files, backs up disks, performs multiple file-scratching and displays the load addresses of hidden machine language files.

The 1541 Disk Manager is available for $12.

Check Reader Service number 400.

Mercury Modem

Mercury, a 300-/1200-baud modem from Computer Friends (6415 S.W. Canyon Court, Suite 10, Portland, OR 97221) supports all popular communications software packages and features front-panel display lights. The modem costs $265 and includes power supply, manual and telephone cable.

Check Reader Service number 412.

Casio CZ Patch Librarian

The Casio CZ Patch Librarian is a program for the C-64 that lets you see all the parameters available on the Casio synthesizer, and each parameter can be altered and immediately auditioned. Groups of 16 patches can be sent to and received from the Casio. You can then alter, delete, rearrange or store the group. Approximately 1000 patches can be stored on one disk.

The package is available for $65 from Dr. T Music Software, 66 Louise Road, Chestnut Hill, MA 02167.

Check Reader Service number 401.

And They're Off!

F&S Software (PO Box 570069, Miami, FL 33257) has released Speedalyzer, a thoroughbred horse-race handicapping program for the C-64. The program uses information taken from the *Daily Racing Form* to analyze races.

Speedalyzer is available on tape and disk for $25.

Check Reader Service number 403.

International Hockey

Artworx (150 North Main St., Fairport, NY 14450) has released International Hockey, a game for the C-64, which provides the same play action as its predecessor, Slapshot Hockey, including speech synthesis and two-player action.

You can also play against the computer in three difficulty levels. Available on disk for $24.95.

Check Reader Service number 404.

Hi-Rise "Commodore-minium"

The Hi-Rise computer/printer stand, from Unique Wood Products

BACK ISSUES

SOLD OUT

April 1984—The world of music. Hypnosis and the C-64, plus Disk Editor 64 program

May 1984—Database programs reviewed. Dragon Quest action game for the VIC, Music Maker program, and a behind-the-scenes look at Commodore

June 1984—The Joy of Modems. C-64 disk utility program, 64 Joystick Artist, and Munchin' Mushrooms game

SOLD OUT

July 1984—Softball Stats program, Commodore in the Hamshack, Morse code program, and Lost in Space game. Playing the ponies with your VIC

August 1984—Sprite utility program, Battleship War and Buried Treasure game

SOLD OUT

September 1984—Education issue. Over 40 educational programs reviewed. What to look for in a terminal program. Demystify your listings. A detective and his Commodore

October 1984—Languages issue: Comal, Logo, Pascal, Pilot and Fortran. SID Serenade, a sprite editor, and a murder mystery game

November 1984—A look at the Plus/4 and C-16, Buyer's Guide to Hardware, printer interfaces examined, Datafile program

December 1984—Trivia craze, Software Buyer's Guide, and Plus/4's word processor

SOLD OUT

Special Issue—Over 500 Magic tricks. Articles to get you up and running with your Commodore, glossary, club's list and reference poster.

SOLD OUT

January 1985—Create Your Own Games. How to select the right printer. Valuable disk tips for beginners.

SOLD OUT

February 1985—Joysticks: which ones to buy and how to use them in your own programs. Learn how to start a Commodore user's group. Fly the Grand Canyon with your VIC.

SOLD OUT

March 1985—Shape Up with Your C-64: reviews of fitness and nutrition programs. Mini-Calc spreadsheet and Money Manager programs. Word processors reviewed.

RUN

Each month RUN also brings you regular columns, reviews, programs and tutorials to help you get the most enjoyment and use out of your Commodore system.

Each back issue costs $3.50 plus $1 for shipping and handling. On orders of 10 or more back issues, there is a flat $7.50 shipping and handling fee. Quantities are limited and we cannot guarantee that all back issues are available. Send your orders to *RUN*, Attn: Back Issue Orders, 80 Pine St., Peterborough, N.H. 03458.

Circle 285 on Reader Service card.

COMMODORE 64
SUPERCADE(R) DISK SOFTWARE

STRIP POKER II: An erotic and sensuous game overtones in video fantsy and computer psychometry. 100% machine language, high quality music, intelligent and fast and fantastic! $49.95

DATA-BLITZ: Backup disk copies super fast with a single drive. Read and write disk errors so you can copy protected disks. $19.95

JOYPEN: A high resolution drawing system that is one of the most powerful available. $29.95 Note: Joypen requires the simon's basic cartridge which is not inlcuded

ASTEROID ATTACK: Laser cannons are your best defence in this fast space game. $19.95

Send your order to:

DATA STREAM (R)
P.O. BOX 87
NAPIER, NEW ZEALAND

Please include $6.00 for airmail. Sorry no C.O.Ds US/Canadian currency, checks, or money orders. Austrailian residents add 20% to software. Airmail is $5.00 NZ residents please write or phone.

90 day guarantee on all products enquires: phone 57766 Napier, NZ

Circle 278 on Reader Service card.

For the C-64 or compatible system:

PRINTSHOP™ GRAPHICS PACKAGE
- 80 unique and new graphics for your signs, banners, cards, and letterhead.
- 12 exciting high-resolution screens. Use in place of kaleidoscopes. View and print with Screen Magic™
- Make your own graphics! Graphic aids, examples, spacing and layout charts included with this package.

THE PINBALL MACHINE DISK
4 original electronic pinball games. Complete with wiring & bonus diagrams. Hours of challenging fun!

$14.95 PER DISK

(Calif. residents add 90¢ sales tax)
All orders add $2 postage & handling
Send check or money order to:

ON-THE-SPOT Graphics Co., Box 4802, Dept B, Los Angeles, CA 90051. SASE for info only

1C-64 is a trademark of Commodore Business Machines, PRINTSHOP™ and Screen Magic™ are trade marks of Broderbund Software, Inc.

Circle 221 on Reader Service card.

PlayNET

National Color C64 Network

GET $19.95 FREE TIME

CALL 1-800-PLAYNET FOR DETAILS

Circle 235 on Reader Service card.

Verbatim
flexible disks

Call Free **(800) 235-4137** for prices and information. Dealer inquiries invited. C.O.D. and charge cards accepted.

VISA

PACIFIC EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA 93401. In Cal. call (800) 592-5935 or (805) 543-1037.

Circle 215 on Reader Service card.

Print Shop is a trademark of Broderbund Software™

GRAPHICS DISK AND MORE!

$14.95

FOR USE WITH **PRINT SHOP™** PROG.

HERE'S WHAT YOU GET:
- 120 NEW GRAPHICS ON DISK
- 60 SAMPLE GREETING CARD VERSES (CHOOSE & USE)
- GRAPHIC MAKING HINTS/EXAMPLES
- GRAPHIC MAKING OVERLAY TOOL
- GREETING CARD LAYOUT FACT CHART **$14.95**

Add $2.00 for postage & handling.
Calif. residents add 90C sales tax.

Send check or M.O. To:

RJ Softshop

4102 E. 7th Street, STE #207A
Long Beach, CA 90804

Circle 270 on Reader Service card.

80 COLUMNS FOR THE C-128

JUST $14.95*

Allow COMMODORE-128 owners the capability of using almost any monochrome or composite monitor with their C-128, and get a full 80 column monochrome screen display for text or word processing use. This popular cable is asked for by almost all owners of C-128 computers which have up-graded from the COMMODORE-64. These users who already own a 1702 composite color or other monitor do not need to purchase an RGB monitor to obtain 80 column display, but can purchase this cable instead.

*Add 3.50 Postage & Handling, CT. Residents Add 7.5% Sales Tax

COMMODORE 128
285.00★

★When Purchased With Above Cable
★Add 12.50 Postage & Handling, Supply Limited

KNIGHT

Knight Software LTD.
Central Village, CT.
(203) 564-5982

Circle 220 on Reader Service card.

Software That Works
For Generations

6 Types of Charts and Sheets
Indices
User Fields
Notes, Footnotes and Sources
No Limits
Adapts to Your Hardware
Comprehensive
Easy to Use

And Much, Much More

Send for brochure and sample printouts.

Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II, IBM PC, Commodore 64 and CP/M.*

Other genealogy software also available.

Price $185. Satisfaction Guaranteed.

American Express, Visa & Mastercard Accepted

* Trademarks for Apple Computer, Inc., International Business Machines, CBM, Inc., & Digital Research.

Family Roots

QUINSEPT, INC.
P.O. Box 216, Lexington, MA 02173
(617) 641-2930

Circle 60 on Reader Service card.

DELUXE RS232 INTERFACE

Omnitronix
VIC-20/C64 DELUXE RS-232 INTERFACE

Whether you want to communicate with a modem, serial printer, another computer, or any other RS232 device, the Deluxe RS232 Interface is the correct choice. Any comparsion will show that it is best Commodore compatible RS232 interface available for any price! The Deluxe RS232 Interface is the culmination of 3 years of working with Commodore users who need an RS232 Interface. It supports all standard RS232 connections (2-8, 12, 20, 22) including Ring Detect and Hi Speed Indicator. Four switches in the RS232 cover allow you to set the unit for virtually any standard RS232 configuration. The unit includes a 3 foot cable with either a male or female DB25 connector (specify which). RS232 plus and minus voltages. Users Manual includes a type-in Basic terminal program, basic program transfer routine, and other examples. Add $2.00 for shipping. Suggested retail $49.95

PRINTMASTER/S (RS232)

This is an RS232 version of our famous Printmaster/+G. It is a serial bus printer interface providing full RS232 signals for an RS232 printer. Supports pins 2-8, 20. Select 300, 600, 1200, 2400, word, and parity. Supports dot graphics and characters on RS232 versions of Epson, Oki, Gorilla, NEC, and more. Includes 3 ft cable with a male or female connector (specify which). Cassette or external power. Add $2.50 for shipping. Suggested retail $119.95

100% 128 COMPATIBLE
See your local dealer or
CALL (206) 236-2983

30 day money back guarantee on all products. Visa and MC welcome. Write to us if you wish to be on a special marketing survey mailing list. DEALERS CALL US!

Omnitronix

P.O. BOX 43-DEPT. 9-MERCER IS., WA 98040

(PO Box 52, Mankato, MN 56001) uses less than two square feet of desktop space to contain your monitor, disk drive and printer.

It is constructed of solid oak with a natural oil finish (or finish it yourself), and is shipped unassembled. A screwdriver and a hammer are all you need to assemble the stand. It retails for $39.95.

Check Reader Service number 421.

Music Connection

Q-R-S Music Rolls (1026 Niagara St., Buffalo, NY 14213) introduces MIDI Magic, a musical instrument digital interface that allows you to connect your C-64 to many electronic musical instruments.

MIDI Magic plugs directly into the user port of the computer and the MIDI In socket on the instrument. The package includes a six-song demo disk and retails for $49.95.

Check Reader Service number 416.

We'll Back You Up

Micro-W (1342B, Route 23, Butler, NJ 07405) has released a new version of its Clone Machine, a utility and backup program for the C-64 and 1541 disk drive. With it, you can back up all file types, including relative files, and can edit tracks and blocks in hex or ASCII. In addition, an enhanced backup file automatically finds and replaces all errors.

Clone Machine's Tough-Nut utility features the ability to duplicate nonstandard sectors, detect and reproduce software containing density/frequency alterations, alter the number of sectors on a track and reformat a single track. This new version of Clone Machine is available for $49.95.

Check Reader Service number 420.

Principles of Composition

Art Instruction Software (PO Box 1352, Patchogue, NY 11772) introduces Principles of Composition, a tutorial that teaches art. With it, you can learn about color, texture, composition, design, shapes and patterns. Features include ease of use, many graphics, a design test and immediate criticism, which shows you what makes for good and poor design.

Principles of Composition is available on two disks for the C-64 for $149.

Check Reader Service number 402.

For Helicopter Pilots

Gunship—The Helicopter Simulator, from MicroProse (120 Lakefront Drive, Hunt Valley, MD 21030), is a new action game for the C-64.

Gunship simulates the AH-64 Apache attack helicopter and features multiple weapon and navigation systems, joystick flying system and 3-D graphics that allow you to maneuver between buildings and ground obstacles with the effect of high-speed flight.

Gunship—The Helicopter Simulator is available on disk for $34.95.

Check Reader Service number 417.

The Whole Bit

Applied Technologies (Lyndon Way, Kittery, ME 03904) has released Version 2.1 of The Whole Bit, its word processing program for the C-64.

Among the many features of this program are: menu selection of printers; the ability to custom-tailor your own print commands for other printers; a Printer Customize routine that allows any or all of the numerous embedded Print commands to be redefined and saved as a file on any one or all of your text-file disks; an extensive on-line Help function; global search and replace; and header, footer and page numbering. Available on disk for $39.95.

Check Reader Service number 418.

For Small Retail Businesses

Version is an integrated, intelligent cash register, inventory and accounting system designed for small retail businesses. The inventory supports 2175 items per disk. Accounting handles 400 records to ledger with data transfer from the sales records.

Features include re-sorted inventory listings, disk formatting and copying, training records and limited error correction on damaged data disks. Menus and function keys enhance program operation. Version is available for $129 from Quillen Engineering, 2204 Yorktowne Drive, Valparaiso, IN 46383.

Check Reader Service number 419.

How to Type in C-64 Listings from *RUN*

Type in 64 Perfect Typist (see Listing 1) and save it to either tape or disk before running it. If you make a mistake entering the Data statements, a message will be printed on your screen. Correct any errors and save the new version.

When you want to type in a C-64 program from *RUN*, first load and run 64 Perfect Typist. Two SYS numbers will be displayed on your screen. Jot these down and keep them handy. They are the SYS numbers for deactivating the checksum and reactivating it.

You might want to deactivate the checksum in the middle of your program entry for some reason. The only way to accomplish this, besides turning off the power, is to type SYS 40794 and press the return key.

After 64 Perfect Typist has been loaded and run, start typing in your program lines just as you normally do. The only difference is that after you have pressed the return key to log in your line, a one-, two- or three-digit number will appear below the line on the left-hand margin. This number, the checksum, will be from 0 to 255.

If the number matches the checksum value given in the program listing, the line is correct, and you can type the next line right over the previous line's checksum value. If the checksum values are different, look through the line for typing or spelling errors. Make any needed changes and hit the return key again. Continue until the program is finished.

When you have entered your program, disable 64 Perfect Typist (by typing the SYS disable number that is shown on the start-up screen), and then save the program as usual. If you run the program and get an Out-of-Memory error, turn the computer off and back on. This will clear 64 Perfect Typist out of memory.

You may save part of a program at any time and continue later. If you've already turned your computer off, you'll have to reload and rerun 64 Perfect Typist, then reload the program you were working on, list it and continue where you left off.

How to Type non-C-64 Listings from *RUN*

For listings other than C-64, we have translated everything we thought might be confusing in any program. When you see something between the curly brackets, all you have to do is press the keys indicated. For example:

{SHIFT L}—means hold down the shift key and press the L key.

{COMD J}—means hold down the Commodore key (it is on the lower left side of the keyboard) and press the J key.

{SHIFT CLR}—hold down the shift key and press the CLR/HOME key.

{HOME}—press the CLR/HOME key without shifting.

{CTRL 6}—hold down the control key and press the 6 key.

{FUNCT 2}—function 2 (in this case, you hold down the shift key and press the function 1 key).

{CRSR UP}{CRSR DN}{CRSR LF}{CRSR RT}—these are the four cursor directions.

{UP ARROW}—means the arrow key (the one with the pi sign under it).

{LB.}—the British pound sign (£).

{PI}—the pi sign key (π); (shift and press the up-arrow key).

In some instances, when numerous characters or spaces are repeated, we will represent them this way: {22 spaces} or {17 CRSR LFs}.

Listing 1. *64 Perfect Typist program.*

```
10 POKE56,PEEK(56)-1:POKE52,PEEK(56):CLR
20 PG=PEEK(56):ML=PG*256+60
30 FORX=MLTOML+154:READD:T=T+D:POKEX,D:NEXT
40 IFT<>16251 THENPRINT"ERROR IN DATA...":E
   ND
60 POKEML+4,PG:POKEML+10,PG:POKEML+16,PG
70 POKEML+20,PG:POKEML+32,PG:POKEML+38,PG
80 POKEML+141,PG
89 PRINT"{SHFT CLR}{CRSR RT}***************
   ***********************"
90 SYSML:PRINT"{CRSR RT}** 64 PERFECT TYPIS
   T IS NOW ACTIVE{2 SPACEs}**"
100 PRINT"{CRSR RT}** SYS"ML"=ON{5 SPACEs}S
    YS"ML+30"=OFF **"
101 PRINT"{CRSR RT}************************
    **************":NEW
110 DATA 173,005,003,201,003,208,001,096
120 DATA 141,105,003,173,004,003,141,104
130 DATA 003,162,103,160,003,142,004,003
140 DATA 140,005,003,096,234,234,173,104
150 DATA 003,141,004,003,173,105,003,141
160 DATA 005,003,096,032,124,165,132,011
170 DATA 162,000,142,240,003,142,241,003
180 DATA 189,000,002,240,051,201,032,208
190 DATA 004,164,212,240,040,201,034,208
200 DATA 008,072,165,212,073,001,133,212
210 DATA 104,072,238,241,003,173,241,003
220 DATA 041,007,168,104,024,072,024,104
230 DATA 016,001,056,042,136,016,246,109
240 DATA 240,003,141,240,003,232,208,200
250 DATA 173,240,003,024,101,020,024,101
260 DATA 021,141,240,003,169,042,032,210
270 DATA 255,169,000,174,240,003,032,205
280 DATA 189,162,003,189,211,003,032,210
290 DATA 255,202,016,247,164,011,096,145
300 DATA 013,032,032
```

RUN AMOK

Item: In our checksum program, 64 Perfect Typist, an annoying graphics character appears with the checksum number on some C-64s. To eliminate this, lines 40 and 280 have been changed in Listing 1, above. You should also make the change if this character has been bugging you.

Item: A problem arises in the Key to Your Disk Directory program (August 1985, p. 70) when a file size is exactly 34 blocks. The program then becomes confused because it looks for the quote mark that precedes a filename, and CHR$(34) is a quote mark. To fix the problem, change lines 170 and 180 and add lines 560, 570 and 1065 as follows:

```
170 DATA 208,63,201,34,240,5,32,52,195,208,240,76,1554
180 DATA 218,195,8,198,199,169,122,133,251,208,213,24,1938
560 DATA 32,165,255,208,251,162,3,32,165,255,202,16
570 DATA 250,165,199,240,3,76,207,193,76,215,193
1065 FOR I=50138 TO 50160:READK:POKEI,K:NEXT
```

Manuscripts: Contributions in the form of manuscripts with drawings and/or photographs are welcome and will be considered for possible publication. *RUN* assumes no responsibility for loss or damage to any material. Please enclose a self-addressed, stamped envelope with each submission. Unsolicited manuscripts that cannot be accepted will be returned only if accompanied by an appropriately sized, adequately stamped, self-addressed envelope. Payment for the use of any unsolicited material will be made upon acceptance. All contributions and editorial correspondence (typed and double-spaced, please) should be directed to *RUN* Editorial Offices, 80 Pine Street, Peterborough, NH 03458; telephone: 603-924-9471. **Advertising Inquiries** should be directed to Advertising Offices, CW Communications/Peterborough, Inc., Elm Street, Peterborough, NH 03458; telephone: 800-441-4403. **Subscription problems or address changes:** Call 1-800-645-9559 or write to *RUN*, Subscription Department, PO Box 954, Farmingdale, NY 11737. **Problems with advertisers:** Send a description of the problem and your current address to: *RUN*, Elm Street, Peterborough, NH 03458, ATTN.: Rita B. Rivard, Customer Service Manager, or call 1-800-441-4403.

RUN is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 57 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Asia's *The Asian Computerworld*; Australia's *Computerworld Australia, Australian PC World, Macworld* and *Directories*; Brazil's *DataNews* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Danmark, PC World* and *RUN* (Commodore); Finland's *Mikro*; France's *Le Monde Informatique, Golden* (Apple), *OPC* (IBM) and *Distributique*; Germany's *Computerwoche, Microcomputerwelt, PC Welt, SoftwareMarkt, CW Edition/Seminar, Computer Business, RUN* and *Apple's*; Italy's *Computerworld Italia* and *PC Magazine*; Japan's *Computerworld Japan*; Mexico's *Computerworld/Mexico* and *CompuMundo*; The Netherland's *ComputerWorld Benelux* and *PC World Benelux*; Norway's *Computerworld Norge, PC World* and *RUN* (Commodore); Saudi Arabia's *Saudi Computerworld*; Spain's *Computerworld/Espana, Microsistemas/PC World* and *Commodore World*; Sweden's *ComputerSweden, Mikrodatorn,* and *Svenska PC*; the UK's *Computer Management, Computer News, PC Business World* and *Computer Business Europe*; the U.S.' *AmigaWorld, Computerworld, Focus Publications, HOT CoCo, inCider, InfoWorld, MacWorld, Micro Marketworld, On Communications, PC World, RUN, 73 Magazine, 80 Micro*; Venezuela's *Computerworld Venezuela*.

List of Advertisers

Reader Service		Page
8	Abacus Software	60, 61
39	Abby's Software	147
153	Aier Products	141
*	Apropos Technology	139
*	Aprotek	33
61	Aquarian Communications	85
243	Aries Marketing Co.	147
*	Batteries Included	97
193	Big Bytes Computer	134
232	Blackship Computer Supply	147
41	Bowater Computer Forms Inc.	83
*	C.O.M.B. Co.	132
*	C.O.M.B. Co.	143
*	C.O.M.B. Co.	87
140	CSM Software	158
85	Cardco, Inc.	COV III
192	Cardinal Software	159
81	Central Point Software, Inc.	147
225	Cheatsheet Products	151
*	Comal Users Group	113
*	Commodore Business Machines	CIV
251	Compumed	135
64	CompuServe	38, 39
*	Computer Centers of America	2, 3
274	Computer Friends Inc.	94
29	Computer Warehouse	151
*	Covox, Inc.	86
198	Crown Custom Covers	141
211	Cursor Products	147
105	Data Share, Inc.	75
285	Data Stream	173
51	Dow Jones News/Retrieval	45
12	Epyx, Inc.	15, 17, 19
14	Eastcoast Software	89
30	Entrepo, Inc.	47
125	Everbright Electronics	157
84	Federal Hill Software	68
*	Firebird Software	67
80	Fiscal Information Services	26
*	GE Information Services	26
201	Glenco Engineering Inc.	144
9	H & E Computronics	20
108	HBH Corp.	150
*	Info Designs, Inc.	CII, 1, 10, 11
32	Inforunner	64
*	Instant Software	121
20	Jason Ranheim Company	71
202	Jason Ranheim Company	88
49	John Henry Software	49
270	Knight Personal Software Ltd.	173
110	Kyan Software	157
*	Lyco Computer	117
119	Mark of the Falcon	172
195	Marvenco	159
143	Megagem	149
17	Megasoft, Ltd.	109
189	Megasoft, Ltd.	21, 126, 127
47	Micro Computer Games Inc.	9
172	Micro W D I Inc.	151
177	Micro World Computers, Inc.	116
91	Microlog Corporation	166
68	Microprose Software	43
157	Microprose Software	31
103	Microprose Software	77
135	Microprose Software	167
43	Mimic Systems	111
10	Mindscape, Inc.	13
*	Navarone Industries	149
345	Nibble Notch Computer Products	161
262	Nimbus Software	169
*	Omegasoft Software	149
60	Omnitronix	143, 174
278	On The Spot Graphic Company	173
171	PC Gallery	101
235	Pacific Exchanges	173
208	Parsec Research	157
221	Playnet	173
120	Powersoft	36
*	Pro-Line Software	48
74	Prof Jones/Frogg House	167
93	Professional Software	27
15	Protecto Enterprizes	90, 91
220	Quinsept Inc.	174
219	R J Brachman Associates	167
215	R. J. Softshop	173
*	RUN	
	ReRUN Library	130
	ReRUN Winter Edition	128
	RUN Special Issue	125
	RUN Binders	167
*	Schnedler Systems	58
90	Skyles Electric Works	145
66	Software Dimensions	56
254	Software Discounters of America	70
118	Software Masters	153
137	Solid State Software	7
22	Starpoint Software	57
25	Strategic Simulations	37
26	Sublogic Corporation	59
40	SubLogic Corporation	95
122	Sunrise Soptware	143
223	T & D Electronics	159
302	Tailored Solutions	142
155	Tenex Computer Express	78, 79
2	Timeworks	25
125	Taiwan Hwan Hong Ent	157
116	Tri Micro	116
209	Tussey Computer Products	99
13	Tymac, Inc.	55
*	Ultrabyte	159
73	Unisource Electronics	141
241	Universal Marketing	172
102	Valuware	163
205	Video File	144
45	Viewdata Corp of America	80, 81
4	Woodbury Software	29
*	Woodbury Software	165
42	World Trade Electronics	50, 51
77	X-10 (USA), Inc.	35
96	Xetec, Inc.	149
117	Zapp Software	149

For further information from our advertisers, circle the corresponding Reader Service number on the Reader Service card.

*This advertiser prefers to be contacted directly.

Advertising Sales:
Steve Robbins; Ken Blakeman;
Nancy Potter
(603)-924-7138 or (800)-411-4403;
West Coast Sales Office:
Giorgio Saluti
(415)-328-3470 or (800)-227-8365
In Calif.: (800)-344-4636

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

December

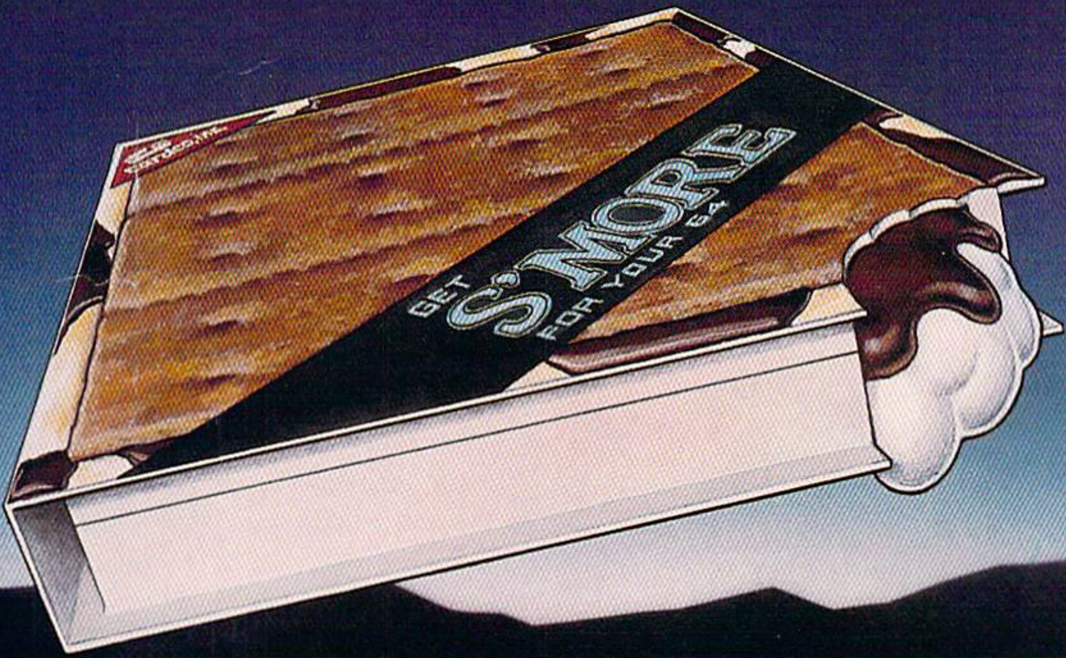
COMING ATTRACTIONS

- **RunTerm Plus**—Part I of a professional-quality terminal program.
- **C-128 Perfect Typist**—This C-128 checksum ensures rapid, accurate entry of C-128 programs.
- **A Holiday Greeting**—Use your C-64 to design and print out your own personalized Christmas cards.
- **Datafile Structure Utility**—This latest addition to the Datafile series lets you examine and print sequential files created by other programs.
- **Home Run Derby**—A top-quality program that lets you experience the thrill and excitement of pitcher/batter confrontations.
- **Plus**—A software buyer's guide, a review of several modems, a discussion of the practical uses of several popular graphics programs and our regular columns and features that help you make your computing experience easier and more enjoyable.

Circle 85 on Reader Service card.

S'MORE
FOR YOUR 64

61,183 delicious bytes for your Commodore 64



S'MORE Memory, S'MORE Power, S'MORE Fun!

Now, 61K available memory
S'MORE frees up 61,183 bytes of C-64 RAM memory for un-restricted Basic programming (57% more than the standard C-64).

A bridge to C-128
The S'MORE command structure is similar to the C-128's new Basic 7.0, providing C-64 users advanced programming techniques.

S'MORE features for programming power

- Over 60 new and enhanced basic commands & functions
- No peeks or pokes (direct access to normally peeked/poked items)
- Full error trapping and automatic error helps
- Full up/down scrolling through program listings
- Structured programming
- Relative files
- Print using
- Formatted inputs
- Print at...and much, much more.

cardco, inc.

The Wizards from the Land of Oz Have done it Again!

CARDCO, Inc./300 S. Topeka/Wichita, KS 67202

HOW TO EVOLVE TO A HIGHER INTELLIGENCE.

THE COMMODORE 128.

The first step is buying the Commodore 128™ Personal Computer. The smartest computer available for the price. It's like getting three computers for less than one usually costs. You can run CP/M® business software, the new programs written for the 128, and over 3,000 Commodore 64® programs. You start out with more software than most machines give you after years on the market.

THE COMMODORE 128 WORKS FASTER.

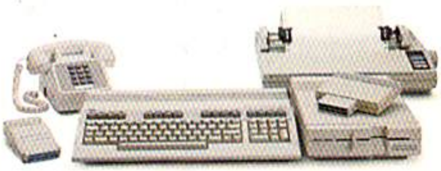
To run all that software and run it faster, you'll want the 1571 Disk Drive. You can't find a faster drive at the price. It transfers nearly 1,000 words a second (5200 cps), so you can load most programs instantly.

THE COMMODORE 128 GETS SMARTER.

Now try improving your memory. Plug in our 1750 RAM Expansion Module and your 128 moves up to a powerful 512K. That's enough to handle just about anything you can dish out, from complicated business forecasting to giant data bases.

THE COMMODORE 128 LEARNS TO COMMUNICATE.

There's no real intelligence without the ability to communicate. So you'll want our 1670 Modem/1200. It puts you in touch with a new world of shopping, banking, communications and information over your telephone line. And it operates at a lightning-fast 1200 baud to save on your phone bill.



THE COMMODORE 128 LEARNS TO WRITE.

Looking good in print could be your next move with the MPS 1000 Printer. It's a new dot matrix printer designed to make the most of the 128's speed and high-resolution graphics. The MPS turns out about 1200 words a minute (100 cps) of draft-quality printing, or gives you near-letter-quality at about 240 words a minute (20 cps).

THE COMMODORE 128 IMPROVES YOUR VISION.

Brains aren't enough without good looks, so improve your vision with Commodore's new 1902 RGB Color Monitor. The high-resolution screen gives you a sharper image and better color than your standard TV, so you can really appreciate the 128's great graphics.

All these evolutionary steps ahead won't set you back when it comes to paying for them. Additions to your Commodore 128 are available at a store near you and are as affordable as the 128 itself. We think that's a smart way to help you build a computer system.

®CP/M is a registered trademark of Digital Research, Inc. © 1985, Commodore Electronics Limited

COMMODORE 128 PERSONAL COMPUTER
A Higher Intelligence